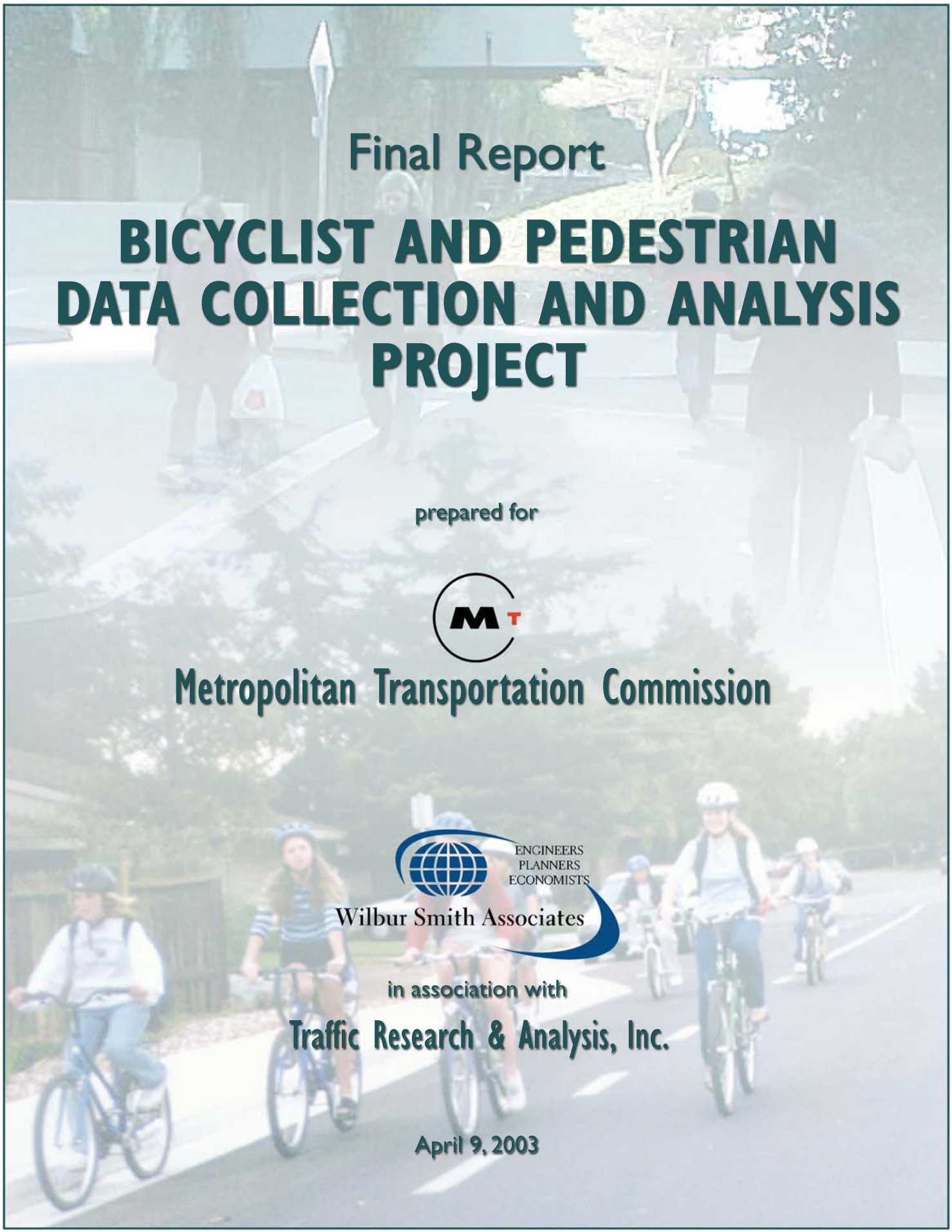

Final Report

BICYCLIST AND PEDESTRIAN DATA COLLECTION AND ANALYSIS PROJECT

prepared for

Metropolitan Transportation Commission

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

in association with

Traffic Research & Analysis, Inc.

April 9, 2003

Bicyclist and Pedestrian Data Collection and Analysis Project

Final Report

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TABLE OF CONTENTS

1. INTRODUCTION

In 2001, the Metropolitan Transportation Commission (MTC) developed the Regional Bicycle Plan, in conjunction with the Regional Bicycle Advisory Committee, and the Regional Pedestrian Program, in conjunction with the Pedestrian Safety Task Force, for inclusion in the 2001 Regional Transportation Plan (RTP). Both efforts identified the lack of data on current bicycle and pedestrian activity as a key constraint. Although vehicle counts are typically conducted as part of standard traffic studies, and bus and rail ridership figures are typically collected to study trends in transit ridership, there is not a comparable effort to collect data on bicycle and pedestrian volumes and facilities.

The purpose of this *Bicyclist and Pedestrian Data Collection and Analysis Project* was to initiate a bicyclist and pedestrian data collection program for the nine Bay Area counties (as shown in Figure 1), including bicyclist and pedestrian counts and surveys of users. The data collected and the results of the analysis conducted for this project are a snapshot of the current bicyclist and pedestrian characteristics and are a sample of the overall bicyclist and pedestrian conditions throughout the region. The database developed by the project will serve as a baseline for future data collection efforts, and will be expanded through further MTC-related projects and through efforts of local and regional jurisdictions.

The study was performed in six steps:

1. Determination of bicycle/pedestrian counts locations
2. Development of survey instrument
3. Development of count and survey methodology
4. Data collection and survey administration
5. Summary and analysis of count and survey results
6. Analysis of bicycle collision rates

Report Organization

This report assembles the various information and findings from each step of the project. Each section briefly summaries the information provided in the various technical memoranda that were produced throughout the study process. The associated technical memoranda are included in the Appendix.

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Figure 1
NINE COUNTIES OF THE SAN FRANCISCO BAY AREA
378980\Regional Map-1/14/03

2. IDENTIFICATION OF COUNT AND SURVEY LOCATIONS

Technical Memorandum 1, in Appendix A, presents the process in developing the list of count locations. *Technical Memorandum 2*, in Appendix B, presents the process for determining the survey locations.

For this effort, about 100 count locations were to be selected. In addition, about 2,000 surveys were to be distributed to bicyclists and pedestrians during the counting effort.

Count Locations

A set of five criteria was used to select the count locations:

1. High bicycle collision rates
2. On the local or regional bicycle network (existing or proposed)
3. Proximity to major transit facilities
4. Proximity to schools and colleges/universities
5. Proximity to local or regional attractions/destinations

A multiple-step process was used to determine the count locations. First, a list of potential count locations was obtained from the Congestion Management Agency (CMA) of each county. In addition, each CMA was asked to provide information on recent or upcoming counting efforts, so that counts would not be duplicated. Second, lists of high collision locations, local/regional bicycle network facilities, major transit facilities, schools/universities and local/regional attractions were made for each county. Third, a count location matrix was developed, in which the CMA-recommended locations and the high incident locations were compared to the other lists. Using this matrix, the potential count locations were evaluated to see if they met the selection criteria. It addition, to ensure a balance of facility types and area types, locations throughout the counties and cities were assessed.

It was determined by MTC staff that counts would be conducted at intersections (including where paths/trails crossed streets), so that the counts would be consistent with standard vehicular turning movement counts.

To ensure a balanced geographical representation of the count locations throughout the nine counties, it was determined that a minimum of eight counts would be performed within each county (72 counts), with the remainder of the counts to distributed to the counties based on their relative size, population, number of jurisdictions, and amount of recent information available.

In addition, it was determined what type of counts would be conducted at each location – bicycle-only, pedestrian-only or bicycle/pedestrian. Overall, 37 bicycle-only, 30 pedestrian-only and 34 bicycle/pedestrian counts were planned to be counted. However, as described in Section 4, counts at 3 bicycle-only, 2 pedestrian-only, and 94 bicycle/pedestrian locations were completed.

A preliminary list of potential count locations for each county was developed, which included the locations that met the most of the selection criteria. These preliminary lists were submitted to MTC for review by MTC staff, the Regional Bicycle Working Group and the Regional Pedestrian Committee. In addition, staff from individual cities and counties provided feedback. Based on this input, the preliminary lists were revised, and a final list of count locations was determined.

Survey Locations

The locations where surveys would be administered was based on the locations where counts would be conducted, since the surveys would be distributed at the same time as the counts. To ensure a balanced geographical representation of survey respondents, it was determined that surveys would be distributed at two locations within each county (18 in total). The survey locations were selected based on the locations in each county which appeared to have the highest activity levels (as observed during preliminary field assessments).

Figures 2A through 2D, in Appendix C, present the selected count and survey locations.

3. SURVEY DEVELOPMENT

Technical Memorandum 2, in Appendix B, presents the development of the survey instrument.

The purpose of the survey effort was to obtain information on the travel patterns and characteristics of bicyclists and pedestrians throughout the region, including origins/destinations, trip purpose, auto ownership, age, frequency of travel by bicycle or walking, use of bicycles as an access mode to transit, and safety issues.

The survey instrument was developed by MTC staff and was in a pre-paid mail-back format, where the respondent dropped the survey in a mailbox after completion.

4. COUNT AND SURVEY METHODOLOGY

Technical Memorandum 3, in Appendix D, presents a summary of the bicyclist/pedestrian count schedule, methodology and procedures. *Technical Memorandum 4*, in Appendix E, presents a summary of survey schedule, methodology and procedures. In addition, a *Handbook for Bicyclist and Pedestrian Counts* was prepared, which includes detailed discussion of the procedures and methodology for conducting the counts and administering the surveys.

Count Methodology

Counts were conducted throughout September and October of 2002. To ensure that that counts were conducted after the school year had begun, school districts and institutions within each county were contacted regarding their start date. In addition, it was necessary for counts to be completed before the end of daylight savings time (October 27, 2002) to ensure that the entire evening count duration would be during sunlight.

Counts were conducted on Tuesdays, Wednesdays and Thursdays only, for both the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods, which represent the standard peak commute hours (and are consistent with most intersection turning movement count time periods). In addition, the evening counts were expanded by two hours (2:00 to 4:00 PM) at selected locations near schools to capture the additional school-related activity (i.e., students leaving school at the end of the day).

Both bicyclist and pedestrians were counted by intersection leg. Bicyclists were counted as they approached the intersection and recorded for the appropriate leg (e.g., a bicyclist traveling southbound towards the intersection was be recorded on the north leg). It should be noted that bicycle turning movements were not recorded. Pedestrians were counted as they crossed the intersection and recorded for the appropriate crosswalk (e.g., a pedestrian crossing the street on the north side should be recorded on the north leg). It should be noted that the direction of travel of the pedestrians was not recorded.

Count supervisors performed site inspections at each count location to observe intersection operations, record the intersection profiles, to determine the number of count technicians required to conduct the counts, and to determine the preferred location for the count technician(s) to be stationed.

At the beginning of each week, the count supervisors met with the count technicians to assign the scheduled count locations for the week, to indicate where the count technicians should be stationed at each intersection, to provide data entry forms and counting equipment, and to review the count procedures. On the day of the counts, count technicians were responsible for their travel to and from the count locations. The count supervisors traveled between their assigned count locations to ensure that the count technicians were in place, the counts were being properly conducted, and to pick up the completed data entry forms. It should be noted that on days when the count locations were spread out, the count supervisors remained at designated locations and the count technicians traveled to and from the count supervisors.

Since bicycle and pedestrian activity can be influenced by weather conditions, events and traffic conditions, weather forecasts and event calendars were examined for the locations scheduled to be counted each week. In addition, daily traffic reports were reviewed to ensure that any major traffic or transit incidents did not affect the schedule count locations. Throughout the count duration, no scheduled counts were cancelled due to weather, events or traffic conditions.

It should be noted that based on the results of the site inspections, it was determined that the count technicians at the low volume locations (primarily those outside of San Francisco) would be able to accurately count both bicyclists and pedestrians. As such, the effort was expanded to include 94 bicycle/pedestrian, 3 bicycle-only and 2 pedestrian-only count locations).

Survey Methodology

The goal of the survey effort was to have returned 500 surveys, which would provide about 400 valid survey responses. Based on previous experience, it was assumed that there would be an

average return rate of 25 percent, which would require the distribution of about 2,000 surveys. To ensure a sufficient supply, MTC produced about 2,500 survey forms.

To meet the goal of 2,000 surveys, the target was to distribute about 100 to 120 surveys at each of the 18 survey locations. Since each location had different amount of activity, the maximum number of surveys to be distributed was limited to 150 surveys per location.

Surveys were administered at the same time as the bicycle/pedestrian counts and were distributed to passing pedestrians and bicyclists. A separate survey technician was responsible for distributing the surveys at each location. Prior to each week of counts and surveys, count supervisors held meetings with the survey administrators to discuss survey administration procedures. As part of the procedures, the survey technicians were provided with a brief explanation of the project to present to the potential survey respondents. In addition, the survey technicians were instructed to distribute about half of the surveys in the morning period and about half the surveys in the evening period.

At the beginning of each day, the survey technicians were provided between 100 and 150 surveys to distribute, based on the observed activity levels at their specific location. The number of surveys provided at each location was recorded by the supervisors.

The survey technicians were stationed at the busiest corner of the intersection and asked passing bicyclists and pedestrians if they would be interested in filling out a brief survey for MTC. Only those bicyclists and pedestrians who were interested in filling out the survey were handed a copy of the survey. In addition, the survey technicians walked around the intersection if survey location was not very active, in order to capture more bicyclists and pedestrians.

At the end of the day, any unused surveys were returned to the count supervisors, and the total surveys handed out were recorded.

5. COUNT AND SURVEY SUMMARIES

Technical Memorandum 3, in Appendix D, presents the bicyclist/pedestrian count results. *Technical Memorandum 4*, in Appendix E, presents the survey results

Summary of Bicyclist/Pedestrian Counts

Table 1 presents a summary of the total bicyclist/pedestrian counts. In general, during both the morning and evening periods, the pedestrian counts were substantially higher than the bicycle counts. Overall, the bicycle counts represented about 16 percent of the total counts during both time periods. In addition, the total evening counts were somewhat higher than the total morning counts (23,085 versus 19,343). This temporal distribution is consistent with typical traffic and bicycle/pedestrian count results, since the morning period tends to be mostly commute traffic, while the evening period tends to have both commute and other (primarily shopping/personal purposes) traffic.

Table 1 Summary of Bicyclist/Pedestrian Counts			
Count Type	**AM Peak Period**	**PM Peak Period**	***Total***
Bicyclists	3,036	3,686	***6,722***
Pedestrians	16,307	19,399	***35,706***
Total	***19,343***	***23,085***	***42,428***

Source: Wilbur Smith Associates – December 2002
Notes:
AM Peak Period = 7:00 to 9:00 AM; PM Peak Period = 4:00 to 6:00 PM

In general, the locations with the highest bicyclist and pedestrian counts were within San Francisco County, whereas the locations with the lowest counts were within Solano County. The counts at the locations within the other seven counties were relatively equal. However, Napa County had some locations with low volume totals.

In addition, the bicyclist and pedestrian counts for the extended school period (2:00 to 4:00 PM) were equal to, or greater than, both the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) counts at each location.

The information from the intersection profile forms and the data entry forms were entered into a computer database. The database included a separate record for each count location (which present the intersection profile, the day and date the counts were performed, and the 15-minute and total period counts), and bicycle/pedestrian count summaries by county and for the entire nine-county region. This database was designed to be expandable, so that new counts could be added and included in the summaries.

Summary of Survey Results

Overall, 2,235 surveys were distributed at the 18 locations. Out of these, 128 completed surveys were returned, which corresponds to a response rate of about 6 percent. Of the returned surveys, 76 respondents (60 percent) answered the questions related to walking, 31 respondents (24 percent) answered the questions related to bicycling, and 21 respondents (16 percent) answered the questions related to both walking and bicycling. It should be noted that for this survey, the results were not weighted due to the low response rate, and because it was not possible to know where each returned surveys were handed out.

In general, the people who responded to the survey were relatively evenly split between males and females, were within the 16-39 and 40-64 age groups, and were relatively evenly split between the four income levels. Most of those surveyed owned a vehicle.

The primary trip purpose of those surveyed was the commute to work, with relatively even percentages for the other purposes (including recreation, school and shopping). On average, the people who responded to the survey used 1.5 other modes of transportation on their trips, primarily walk and auto. Most of the trips started at home, and the majority of the trips ended at work or at home. For about half of those surveyed, the origin and destination of their trip was within the same county, although a substantial number of respondents did not answer the

question. Inter-county travel was primarily between Alameda, Contra Costa and San Francisco counties.

About 23 percent of those surveyed had been involved in a crash or accident while walking or bicycling. Of those, about 77 percent suffered little or no injury. The majority of accidents (60 percent) were not reported to the police.

The pedestrian respondents tended to walk frequently and for long duration, as about 25 percent of those surveyed walked less than 10 minutes per day, about 28 percent of those surveyed walked between 10 and 30 minutes per day, and about 31 percent of those surveyed walked over 30 minutes per day. For both the between 10 and 30 minutes and the over 30 minutes categories, most respondents walked this duration five times or more per week. Respondents tended to feel safe when crossing the street, as 65 percent of those surveyed ranked their safety between 6 and 10 (with 10 being very safe). In addition, respondents tended to feel that the pedestrian phases at signals provided sufficient crossing time. It should be noted that the majority of the respondents felt that tickets should be issued to pedestrians for unlawful behavior, whereas most respondents admitted to jaywalking at least sometimes.

The bicyclist respondents chose to bicycle for about three to four reasons, primarily for personal reasons (exercise/recreation, health, protect the environment). In addition, a substantial portion of the respondents chose to bicycle because it was more convenient or saved time. Relatively few respondents bicycled because parking was not available or they did not have a car available. Most of the respondents used their bicycles regularly, for a short distance or time. About half of those surveyed used public transit at least a few times a week, but did not often take their bicycles on transit. Respondents preferred to ride on bicycle trails, followed by painted bicycle lanes, identified bicycle routes and city streets. Respondents tended to feel safe when bicycling, as about 62 percent of those surveyed ranked their safety between 6 and 10 (with 10 being very safe). In addition, respondents tended to feel that more bicycle trails and paths, or bicycle lanes on the street would make them feel more safe. Conversely, having motorists follow the rules of the road or slower-moving cars would not make respondents feel substantially more safe. It should be noted that the majority of the respondents felt that tickets should be issued to bicyclists for unlawful behavior, whereas almost all respondents admitted to not stopping at STOP signs at least some of the time. In addition, about 63 percent of those surveyed generally wear a helmet when riding.

To determine if there was any significant correlation among the survey responses, cross-tabulations were conduced between the respondent demographics (i.e., gender, age and income) and the survey results (i.e., trip purpose, walking and bicycling responses), and between the different survey results. Overall, the cross-tabulations did not result in any significant findings for the survey respondents. In general, there was no direct correlation between the various survey responses (e.g., frequent bicycles users were not more likely to use public transit), or the relationships were expected (e.g., older respondents did not jaywalk as much as younger respondents). It should be noted that these conclusions may be affected by the relatively small sample size, and are only applicable to the survey respondents, not overall population in each county.

6. ANALYSIS OF BICYCLIST COLLISION RATES

Technical Memorandum 5, in Appendix F, presents the bicyclist collision rate analysis.

The purpose of this effort was to estimate the current collision rates for bicyclists at the locations where bicyclists counts were conducted in the data collection phase of the project. It should be noted that a similar analysis of pedestrian collision rates was not conducted since pedestrian collision information was not available from MTC.

At each of the locations, the total morning peak period (7:00 to 9:00 AM) and evening peak period (4:00 to 6:00 PM) bicyclist counts were converted into estimated daily and annual bicycle volumes. The number of bicycle-related collisions were obtained from the MTC 2001 Regional Bicycle Plan GIS map, which was based on the California Highway Patrol's *Statewide Integrated Traffic Records System* (*SWITRS*) database for years 1991-2000. Since the data was for a 10-year period, the number of collision at each location was divided by a factor of 10 to estimate the average number of collisions per year. Based on these numbers, the number of bicycle collisions per million bicycle trips was determined for each location.

Comparisons were conducted to determine potential relationships between the collision rates and the estimated daily bicycle volumes, location of the counts and the area type. For this analysis, the average collision rates were determined for each category and compared between categories. Overall, it was found that locations in urban environments and locations with high volumes of bicycle traffic tended to have the lowest collision rates, whereas rural environments and locations with low volumes of bicycle traffic tended to have the highest collision rates. These relationships are likely due to familiarity with bicycle activity at these locations (i.e., drivers, pedestrians and bicyclist are accustomed to each other), the provision of bicycle facilities, and the average speed of traffic. No correlation was found between the average collision rates and the county characteristics.

It should be noted that since the bicyclist counts were conducted during the peak morning and evening commute periods on weekdays, locations that primarily serve recreational users would have lower counts than anticipated (and corresponding lower estimated daily volumes and lower estimated annual volumes). In addition, at locations with low bicycle volumes, a small number of collisions would result in high collision rates. Therefore, it is possible that high collision rates at low volume locations may not accurately reflect conditions at these locations.

7. CONCLUSION

This section provides a review of the results of the study effort and identifies means to improve the counts, surveys and collision analysis.

Overall, the data collected for this project represents a snapshot of the current bicycle and pedestrian activity throughout the nine-county region. In addition, the count database will serve as a baseline for future data collection efforts. As part of this project, a Handbook was developed to present guidelines for conducting bicyclist/pedestrian counts and for administering user surveys. The detailed procedures and methodologies included in the handbook should be

used to continue the counting efforts for this project, and to perform other bicyclist and pedestrian counts.

Study Findings

At the 101 count locations (including three bicycle-only, two pedestrian-only and 94 bicycle/pedestrian locations), approximately 6,722 bicyclists and 35,706 pedestrians were counted. About 45 percent of the bicyclists and pedestrians were counted in the morning period, and about 55 percent were counted in the evening period. In addition, at the locations where the extended school counts were conducted, the counts were equal to, or greater than, both the morning and evening counts at the location.

At the 18 survey locations, a total of 2,235 surveys were distributed and 128 completed surveys were returned (a 6 percent response rate). Of the returned surveys, about 60 percent answered the questions related to walking, 24 percent answered the questions related to bicycling, and 16 percent answered the questions related to both walking and bicycling.

Collision rates were developed for each of the locations where bicyclist counts were conducted, and were based on the counted volumes and average *SWITRS* accident information. In comparing the collision rates, it was found that locations in urban environments and locations with high volumes of bicycle traffic tended to have the lowest collision rates, whereas rural environments and locations with low volumes of bicycle traffic tended to have the highest collision rates.

Possible Improvements/Enhancements for Future Studies

Based on the results of the count effort, it was found that one count technician was able to accurately count both bicyclists and pedestrians at one time, except at the high volume locations. As such, the amount of bicycle and pedestrian data collected for this project was greater than originally planned.

Possible improvements to the survey instrument and procedures were developed to address the low response rate, to improve survey clarification, and to address some difficulties in analyzing the results. For example, it was recommended that the survey include a key or serial number to allow for weighing of the survey results, separate surveys be used for bicyclists and pedestrians, questions with low response rates be revised or eliminated, and that the survey be administered as an intercept survey instead of a mail-back survey.

The results of the bicycle collision analysis were somewhat limited, due to the data sources available. To improve the analysis, the conversion from peak period to daily and annual bicycle volumes could be revised to better account for weekend and recreation users. In addition, the most-recent *SWITRS* data should be used, and disaggregated between collision type and facility type. Also, a similar analysis could be conducted for pedestrians if pedestrian collision data becomes available.

If additional bicyclist and pedestrian counting efforts are conducted, any new procedures or recommendations should be included in future versions of the Handbook.

APPENDIX A

TECHNICAL MEMORANDUM 1 – SELECTION OF COUNT LOCATIONS

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PLANNERS
ECONOMISTS

Wilbur Smith Associates

MEMO

SAN FRANCISCO OFFICE
October 30, 2002 Project Number: 378980

To: Trent Lethco, MTC Project Manager

From: Tim Erney

Subject: MTC Bicycle and Pedestrian Data Collection Project
Technical Memorandum 1 – Selection of Count Locations

This memorandum presents the criteria and methodology used in selecting the count locations for the MTC Bicycle and Pedestrian Data Collection project. The purpose of the bicycle/ pedestrian counts is to determine the current usage levels at various types of bicycle and pedestrians facilities throughout the nine county region (Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo and San Francisco counties). The criteria used in selecting the count locations included:

1. High bicycle collision rates
2. On local or regional bicycle network (existing or proposed)
3. Proximity to major transit facilities
4. Proximity to schools and universities
5. Proximity to local or regional attractions/destinations

The following sections present detailed discussion regarding the criteria and evaluation methodology used in determining the count locations.

The first step in the process was to obtain a list of potential count locations from each of the nine counties. Each county CMA was asked to submit a list of locations where bicycle and/or pedestrian counts should be considered, keeping in mind the criteria listed above. In addition, each county CMA was asked to provide information on recent or upcoming bicycle or pedestrian counting efforts (either at the city or county level), so that counts would not be duplicated.

The second step in the process was to create lists of the high bicycle collision locations, local/ regional bicycle network facilities, major transit facilities, schools/universities and local/regional attractions.

- Using the MTC 2001 GIS Regional Bike Plan map, collision data was obtained from the collision map "layer". Based on this information, the intersections with the highest number

of reported bicycle collisions were recorded for each county. It should be noted that these bicycle collision rates were used, in part, as a stand-in for bicycle volumes (since higher volume locations tend to have more collisions).

- Using the MTC 2001 GIS Regional Bike Plan map, plus local and regional bicycle plans, the regional bikeway networks for each county were identified. In addition, using local general or bicycle plans, the local bikeways were identified.
- The major transit centers/depots within each county were identified, including BART, Caltrain, Amtrak and Ferry stations. In addition, the major bus depots and transit malls were identified.
- All major education facilities within each county were identified, including grade schools, high schools, colleges and universities.
- The major local and regional attractions within each county were identified, including city halls, civic centers, shopping malls and districts (such as Fourth Street in Berkeley), employment centers and recreational area.

From this information, a count location matrix was developed. For each potential count location provided by the CMAs and each intersection with high number of incidents, it was determined if the location was on the local/regional bicycle network or was near a major transit center, school or local/regional attraction. Using this matrix, the potential count locations were evaluated to see if they met the selection criteria, and locations that met the most criteria were selected.

To ensure a balanced geographical representation of the count locations throughout the nine counties, it was determined that a minimum of eight counts would be performed within each county. The remainder of the counts (about 28) were then distributed to the counties based on their relative size, population and number of jurisdictions. In addition, the distribution of the remaining count locations reflected the amount of bicycle and pedestrian information available for each county, with counties with limited information receiving additional count locations.

Draft lists of count locations was submitted MTC on August 23, 2002 (for San Francisco, Marin, Solano and Santa Clara counties) and on August 30, 2002 (for Sonoma, Napa, Contra Costa, Alameda and San Mateo counties), for review by MTC, the Regional Bicycle Working Group and the Regional Pedestrian Committee. Based on feedback received from MTC staff, the working groups and committees, and individual cities and counties, the draft lists were revised and resubmitted to MTC. In general, the feedback included recommendations for relocation of the counts to known problem locations or locations of interest to the city or county.

The attached tables present the final count locations for each county, including the identification of the counts (bicycle-only, pedestrian-only and bicycle-pedestrian) to be conducted at each location.

MTC Bike/Ped Data Collection Project

Count Location List

Contra Costa County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
CC01	Antioch	L St. @ 18th St	x	x	1		6/0		High	CC County Fairgrounds
CC02	Brentwood	Brentwood Blvd @ Oak	x		0		0/0		several	Civic Center
CC03	Concord	Grant @ Concord Blvd		x	0		6/3	BART		
CC04	County/P.H.	Coggins and Jones @ Treat	x	x	5	Iron Horse	adj 1/0	BART		
CC05	Danville	Railroad Ave @ Hartz/Danville Blvd	x		5		0/3			Iron Horse Plaza
CC06	El Cerrito	Ohlone Trail @ Fairmount Ave		x	0		1/0	BART	Elem, High	El Cerrito Plaza Shopping Ctr
CC07	Lafayette	Mt. Diablo @ Moraga Rd	x	x	0		6/0	BART	Elem	Boy Scouts, library
CC08	Martinez	Muir Rd @ Pacheco Blvd	x		0		5/2			Contra Costa Canal Tr
CC09	Orinda	Moraga Wy @ Ivy Dr	x	x	0		2/0		High	
CC10	Pittsburg	Delta De Anza Trail @ Los Medanos	x		0	Local	MTC Net		Los Medanos College	
CC11	Richmond	MacDonald @ Marina	x	x	4		0/0	BART, Amtrak		Kaiser
CC12	San Ramon	Executive Prkwy @ Camino Ramon		x	0		0/0	San Ramon		Bishop Ranch Ex Park
CC13	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	x		9		3/0	BART	Mid	Soc. Sec. Admin

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project
Count Location List
Marin County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
MA01	C. Madera	Camino Alto @ Madera/Chapman	x	x	1	multiuse	0/0		Elem	Corte Madera Civic Center
MA02	Fairfax	Pacheco @ Center/Broadway		x	10		5/0			Civic Center
MA03	Larkspur	E. S.F. Drake @ Larkspur Landing	x	x	3	lane (SFD)	4/0	GG Ferry, park&ride		Hospital
MA04	Novato	Grant @ 7th St	x		12		0/0			
MA05	Novato	Alameda del Prado/Nave Dr		x	x					Park & Ride
MA06	San Rafael	4th St @ Lincoln Ave	x		15		5/0	park&ride, transit center		Civic Center
MA07	San Rafael	B St @ 2nd St		x	12		0/0	Transit Center		City Hall, Comm. Center
MA08	Sausalito	Bridgeway @ Princess	x		20		5/0	Ferries		Harbor, Beaches
MA09	Mill Valley	Mill Valley Path @ E. Blithdale	x	x	-	multiuse	1/5		Mid	Rec. Center, Bayfront park
MA10	Tiburon	Main St @ Tiburon Blvd		x		lane (Tibur)	0/3	Ferry Terminal		Downton, City Hall
MA11	Mill Valley	101 @ Seminary		x	0		0/0	GGT bus		

KEY:
Jurisdiction - City in which intersection is located
Location - Intersection where count is to be taken
Bike - Bike count
Ped - Pedestrian count
Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map
Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection
Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility
Transit Center - Transit Center located adjacent to intersection
School - School located adjacent to intersection
Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

Napa County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
NA01	American Canyon	SR 29 @ American Canyon		x	0		5/0			
NA02	Calistoga	Lincoln St (SR 29) @ Washington St	x	x	0		6/0		Elem, High	City Hall
NA03	County	Dry Creek @ Orchard	x		0		0/0			heavy rec use
NA04	County	Old Sonoma Rd @ 121	x		1		6/5			
NA05	Napa	Lincoln Ave @ Jefferson St	x	x	11		0/0		Napa High	Wine Train, Napa Skate Park,
NA06	Napa	1st @ School Rd		x	2		6/0		Mid	Bel Aire Plaza
NA07	Oakville	Siverado Trail @ Oakville Cross	x		1		2/0			wineries, rec areas
NA08	St Helena	Main (SR 29) @ Adams (St. Helena Hwy)		x	4		0/0		Elem	City Hall
NA09	Yountville	Finnell @ Yountville	x	x	1		0/5			

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project
Count Location List
San Francisco County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SF01	SF	3rd St @ Howard		x	4	existing	0/5	Transbay Term, Caltrain	City College	Yerba Buena, SOMA, Metreon
SF02	SF	Embarcadero @ Washington	x	x	3	existing 1/6	2/0	Ferry Building	2 Elem	Piers, GG Ath. Club
SF03	SF	Seventh @ Folsom	x	x	15	existing lanes	0/2	BART		Moscone, Metreon
SF04	SF	Geary @ Divasadero		x	4	proposed	0/0		Mid, Elem	Kaiser, japantown
SF05	SF	GG Park Panhandle @ Baker St	x		1	existing 2/2	0/0		2 Elem, High	DMV, GG Park
SF06	SF	Haight @ Scott	x		25	existing	0/0			Haight St
SF07	SF	Van Ness @ Turk	x		16	existing	0/0			Kaiser, Rec Center
SF08	SF	Ocean @ Geneva		x			5/0	Balboa Park BART, Muni	City College	
SF09	SF	3rd St @ 16th St	x		3	proposed	5/0			Park

KEY:
Jurisdiction - City in which intersection is located
Location - Intersection where count is to be taken
Bike - Bike count
Ped - Pedestrian count
Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map
Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection
Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility
Transit Center - Transit Center located adjacent to intersection
School - School located adjacent to intersection
Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

San Mateo County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SM01	Belmont	Ralston @ 6th	x	x	6		3/0	Caltrain	High, College	City Hall
SM02	Burlingame	California Dr @ Lincoln Ave	x		10		6/0	Caltrain		
SM03	Daly City	John Daly Blvd @ Lake Merced Blvd	x		0		0/6			Comm Ctr, L. Merced, Westlake
SM04	Daly City	Mission @ E. Market		x	0		6/0	BART	Elem, Mid, High	
SM05	East Palo Alto	University @ Bay Road	x	x	5		3/3			
SM06	Foster City	Hillsdale Blvd @ Edgewater Blvd	x		8		6/0			
SM07	Half Moon Bay	Main @ Correas		x	0		0/0			
SM08	Millbrae	Millbrae @ Magnolia	x	x	0		0/6	Caltrain, BART	High	
SM09	Pacifica	Francisco @ Paloma	x	x	0		0/0			City Hall
SM10	Redwood City	Main @ Middlefield		x	3		0/6	Caltrain, Samtrans		City Hall, County Center
SM11	Redwood Shores	Redwood Shores @ Twin Dolphin	x		1		0/0	Caltrain		
SM12	San Bruno	El Camino @ Sneath	x	x	0		0/0	BART, Samtrans		Tanforan Shopping Ctr
SM13	San Mateo	Delaware St @ 3rd Ave	x		11		3/6	Caltrain		Hospital
SM14	South SF	Grand @ Airport Blvd		x	1		6/6			City Hall

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

Santa Clara County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SC01	Campbell	Bascom @ Hamilton	x		11		1/0		High	Plaza
SC02	Cupertino	Stevens Creek @ De Anza	x	x	3		0/0		De Anza Coll., 2 Elem	Stanford, Park
SC03	Gilroy	Monterey @ 7th St	x	x	2		6/0			
SC04	Milpitas	Dixon Landing @ Milpitas		x	6		0/2		Elem	City Hall, YMCA
SC05	Morgan Hill	Monterey @ Main (El Camino Real)	x	x	1		6/0		Mid	
SC06	Mountain View	California St @ Escuela Av	x		20		0/0		Elem	Rengstroff Park
SC07	Palo Alto	Foothill @ Page Mill	x	x	1	existing	2/5		Stanford	DT Morgan Hill
SC08	Palo Alto	University @ Emerson		x		existing	0/0	Caltrain		University St, Civic Center
SC09	San Jose	San Fernando @ 7th	x				0/0		San Jose State, Elem	
SC10	San Jose	Santa Clara @ Montgomery		x	1		0/0	Caltrain (Diridon)		San Jose Arena
SC11	Santa Clara	El Camino Real @ Railroad		x			0/0	Caltrain	Santa Clara University	
SC12	Santa Clara	Homestead Rd @ Kiely Blvd	x		14		6/5		High	Kaiser, Central Park

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

Santa Clara County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SC01	Campbell	Bascom @ Hamilton	x		11		1/0		High	Plaza
SC02	Cupertino	Stevens Creek @ De Anza	x	x	3		0/0		De Anza Coll., 2 Elem	Stanford, Park
SC03	Gilroy	Monterey @ 7th St	x	x	2		6/0			
SC04	Milpitas	Dixon Landing @ Milpitas		x	6		0/2		Elem	City Hall, YMCA
SC05	Morgan Hill	Monterey @ Main (El Camino Real)	x	x	1		6/0		Mid	
SC06	Mountain View	California St @ Escuela Av	x		20		0/0		Elem	Rengstroff Park
SC07	Palo Alto	Foothill @ Page Mill	x	x	1	existing	2/5		Stanford	DT Morgan Hill
SC08	Palo Alto	University @ Emerson		x		existing	0/0	Caltrain		University St, Civic Center
SC09	San Jose	San Fernando @ 7th	x				0/0		San Jose State, Elem	
SC10	San Jose	Santa Clara @ Montgomery		x	1		0/0	Caltrain (Diridon)		San Jose Arena
SC11	Santa Clara	El Camino Real @ Railroad		x			0/0	Caltrain	Santa Clara University	
SC12	Santa Clara	Homestead Rd @ Kiely Blvd	x		14		6/5		High	Kaiser, Central Park

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

Solano County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SL01	Benicia	Military West @ 2nd St	x		3	exist/proposed	2/5	Civic Center	HS	
SL02	County	Dixon-Davis Bike Route @ Vaughn	x		0	existing	2/0			
SL03	Dixon	First Street @ C St		x	1		2/0		school	
SL04	Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	x		1	exist/proposed	0/5		HS	
SL05	Fairfield	Travis @ Texas	x	x	12		0/0		Elem	Lee Bell Park
SL06	Rio Vista	Downtown Waterfront Path	x	x		existing	0/0			
SL07	Suisun City	Main @ Lotz	x	x	0		5/0	Amtrak, Bus Depot		City Hall
SL08	Vacaville	Alamo @ Nut Tree	x		10	existing	2/0		Elem	Shopping
SL09	Vacaville	Downtown Creekwalk		x		existing	0/0			
SL10	Vallejo	Solano Bikeway @ Columbus Prkwy	x		0	Solano Bikeway	1/0			
SL11	Vallejo	Waterfront Path	x	x		existing	0/0	Ferry Terminal		

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

MTC Bike/Ped Data Collection Project

Count Location List

Sonoma County

Int. #	Jurisdiction	Location	Counts		# of	Bikeways		Transit Center	School	Activity Center
			Bike	Ped	Collisions	Local	Regional			
SN01	Cotati	Old Redwood Hwy @ Cotati Ave		x			5/0	Park & Ride		The Plaza
SN02	Healdsburg	Healdsburg Ave @ Matheson St		x	1		0/0			Plaza Park
SN03	Petaluma	A' St @ Howard St and 6th St	x	x	12		0/0			City Hall, Museum
SN04	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	x		0		2/0		Sonoma St. U.	
SN05	Santa Rosa	2nd St @ Santa Rosa Ave	x	x	20		0/0	Bus Depot		City Hall
SN06	Santa Rosa	Mendocino Ave @ Pacific Ave	x	x	17		6/0		Junior Coll.	
SN07	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	x		0		5/1			
SN08	Sonoma	Hwy 12-Sonoma Hwy @ Verano	x		0		6/5			Boyes Hot Springs
SN09	Sonoma	Broadway @ W. Napa St (12)		x	0		6/6			City Hall, Town Square

KEY:

Jurisdiction - City in which intersection is located

Location - Intersection where count is to be taken

Bike - Bike count

Ped - Pedestrian count

Collisions - Reported # of bicycle collisions from MTC 2001 Regional Bike Plan map

Local BW - Local bikeways (trail, path, lane, route) present on one or more of streets of intersection

Reg BW - 1 - Existing Class 1 Bicycle Facility 4 - Proposed Class 1 Bicycle Facility
2 - Existing Class 2 Bicycle Facility 5 - Proposed Class 2 Bicycle Facility
3 - Existing Class 3 Bicycle Facility 6 - Proposed Class 3 Bicycle Facility

Transit Center - Transit Center located adjacent to intersection

School - School located adjacent to intersection

Activity Center - Activity Center or attractor located adjacent to intersection

APPENDIX B

TECHNICAL MEMORANDUM 2 – SURVEY ADMINISTRATION METHODOLOGY

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

MEMO

SAN FRANCISCO OFFICE
October 30, 2002 Project Number: 378980

To: Trent Lethco, MTC Project Manager

From: Tim Erney

Subject: MTC Bicycle and Pedestrian Data Collection Project
Technical Memorandum 2 – Survey Administration Methodology

This memorandum presents the methodology for the administration of the bicyclist/pedestrian survey component of the MTC Bicycle and Pedestrian Data Collection project. The purpose of the survey is to obtain information on the travel patterns and characteristics of bicycles and pedestrians throughout the nine county region, including origin/ destination information, trip purpose, auto ownership, age, frequency of traveling by bicycle or by walking, use of bicycles as an access mode to transit, and safety issues.

The survey instrument (attached) was developed by MTC staff, and reviewed by WSA staff, in August 2002. The survey is in a pre-paid mail-back format, where the respondent will drop the survey in a mailbox after completion. It is anticipated that surveys will be handed out to passing pedestrians and bicyclists at each count location. The returned surveys will be sent to MTC and forwarded to WSA for data entry, summarization and analysis. A technical memorandum will then be prepared, summarizing the survey analysis and results.

The goal of the survey effort is to have 500 surveys returned, which is anticipated to provide about 400 valid survey responses. Assuming an average return rate of 25 percent (based on previous experience), about 2,000 surveys will be distributed.

Surveys will be handed out at the same time the bicycle/pedestrian counts will be performed (on a Tuesday, Wednesday or Thursday, and from 7:00 to 9:00 AM and 4:00 to 6:00 PM). However, since there will be about 100 count locations, surveys will not be distributed at each location. Instead, there will be about two survey locations per county (about 20 in total), in order to ensure a relatively equal distribution of survey results. The survey locations were determined from the finalized list of count locations, and include the two highest activity areas for each county (to ensure that a sufficient number of surveys are distributed). The following table presents the locations where the surveys will be distributed.

Table 1
Survey Distribution Locations

County	Jurisdiction	Location
Alameda County	Berkeley Oakland	Hearst @ Oxford 66th @ San Leandro
Contra Costa County	Concord Lafayette	Grant @ Concord Blvd. Mt. Diablo @ Moraga
Marin County	Larkspur San Rafael	East St. Francis Drake @ Larkspur Landing B @ 2nd
Napa County	Calistoga Napa	Lincoln (SR 29) @ Washington Lincoln @ Jefferson
San Francisco County	San Francisco San Francisco	The Embarcadero @ Washington Ocean @ Geneva
San Mateo County	Millbrae Redwood City	Millbrae @ Magnolia Main @ Middlefield
Santa Clara County	Palo Alto Santa Clara	Foothill @ Page Mill El Camino Real @ Railroad
Solano County	Fairfield Vacaville	Travis @ Texas Alamo @ Nut Tree
Sonoma County	Santa Rosa Sonoma	2nd @ Santa Rosa Ave. Broadway @ W. Napa St. (SR 12)

APPENDIX C

MAPS OF COUNT AND SURVEY LOCATIONS

MARIN COUNTY

MA01	Corte Madera	Camino Alto @ Madera/Chapman
MA02	Fairfax	Pacheco Ave @ Center/Broadway
MA03	Larkspur	Sir Francis Drake @ Larkspur Landing
MA04	Novato	Grant Ave @ 7th St
MA05	Novato	Alameda del Prado/Nave Dr (101 Overcross)
MA06	San Rafael	4th St @ Lincoln Ave
MA07	San Rafael	B St @ 2nd St
MA08	Sausalito	Bridgeway @ Princess
MA09	Mill Valley	Mill Valley Path @ E. Blithdale
MA10	Tiburon	Main St @ Tiburon Blvd
MA11	Mill Valley	Seminary @ Hwy 101

SAN FRANCISCO COUNTY

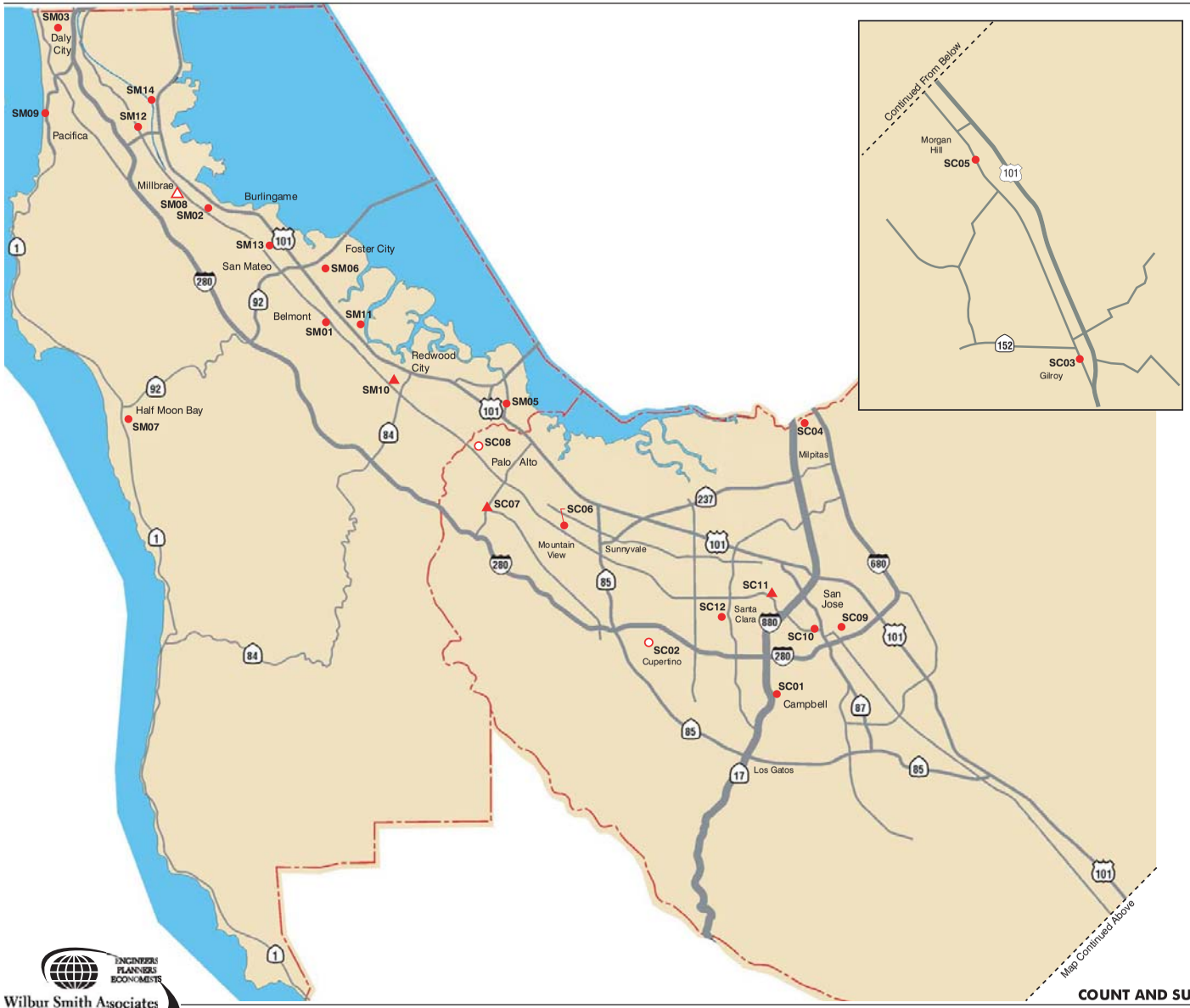
SF01	San Francisco	3rd St @ Howard
SF02	San Francisco	Embarcadero @ Washington
SF03	San Francisco	Seventh @ Folsom
SF04	San Francisco	Geary @ Divasadero
SF05	San Francisco	GG Park Panhandle @ Baker St
SF06	San Francisco	Haight @ Scott
SF07	San Francisco	Van Ness @ Turk
SF08	San Francisco	Ocean @ Geneva
SF09	San Francisco	3rd St @ 16th St

NORTH
NOT TO SCALE

- ● Count Location
- ○ Count Location with Extended Hours
- ▲ Count and Survey Location
- △ Count with Extended Hours and Survey Location

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Figure 2A
COUNT AND SURVEY LOCATIONS - SAN FRANCISCO AND MARIN COUNTIES
378980\SF-MARIN - 1/9/03



SAN MATEO COUNTY

1	SM01	Belmont	Ralston @ 6th
2	SM02	Burlingame	California Dr @ Lincoln Ave
3	SM03	Daly City	Lake Merced @ John Daly
4	SM04	Daly City	Mission @ e. Market
5	SM05	East Palo Alto	University @ Bay Road
6	SM06	Foster City	Hillsdale Blvd @ Edgewater Blvd
7	SM07	Half Moon Bay	Main @ Correas
8	SM08	Millbrae	Millbrae @ Magnolia
9	SM09	Pacifica	Francisco @ Paloma
10	SM10	Redwood City	Main @ Middlefield
11	SM11	Redwood Shores	Redwood Shores @ Twin Dolphin
12	SM12	San Bruno	El Camino @ Sneath
13	SM13	San Mateo	Delaware St @ 3rd Ave
14	SM14	South San Francisco	Grand @ Airport Blvd

SANTA CLARA COUNTY

15	SC01	Campbell	Bascom @ Hamilton
16	SC02	Cupertino	Stevens Creek @ De Anza
17	SC03	Gilroy	Monterey @ 7th Street
18	SC04	Milpitas	Dixon Landing @ Milpitas
19	SC05	Morgan Hill	Monterey @ Main (El Camino)
20	SC06	Mountain View	California @ Escuela Av
21	SC07	Palo Alto	Foothill @ Page Mill
22	SC08	Palo Alto	University @ Emerson
23	SC09	San Jose	San Fernando @ 7th
24	SC10	San Jose	Santa Clara @ Montgomery
25	SC11	Santa Clara	El Camino Real @ Railroad
26	SC12	Santa Clara	Homestead Rd @ Kiely Blvd

NORTH
NOT TO SCALE

- ● Count Location
- ○ Count Location with Extended Hours
- ▲ Count and Survey Location
- △ Count with Extended Hours and Survey Location

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Figure 2B
COUNT AND SURVEY LOCATIONS - SAN MATEO AND SANTA CLARA COUNTIES
378980\SANTA CLARA-SAN MATEO - 1/9/03

ALAMEDA COUNTY

1	AL01	Alameda	Otis @ Park
2	AL02	Berkeley	Hearst @ Oxford
3	AL03	Berkeley	Virginia @ San Pablo
4	AL04	Dublin	Iron Horse @ Dublin Blvd.
5	AL05	Emeryville	Powell St @ Christie
6	AL06	Fremont	Fremont Blvd @ Mowry
7	AL07	Hayward	Winton @ Amador
8	AL08	Livermore	Wente St/Concannon @ Livermore Ave
9	AL09	Oakland	Grand Ave @ Staten Ave
10	AL10	Oakland	66th @ San Leandro
11	AL11	Pleasanton	Bernal @ Main
12	AL12	San Leandro	Bancroft @ Estudilio
13	AL13	Union City	Alvarado-Niles @ Decoto

CONTRA COSTA COUNTY

14	CC01	Antioch	L St @ 18th St
15	CC02	Brentwood	Brentwood Blvd. @ Oak
16	CC03	Concord	Grant @ Concord Blvd.
17	CC04	County/P.H.	Coggins and Jones @ Treat
18	CC05	Danville	Railroad Ave @ Hartz/Danville Blvd.
19	CC06	El Cerrito	Ohlone Trail @ Fairmount Ave
20	CC07	Lafayette	Mt. Diablo @ Moraga Rd.
21	CC08	Martinez	Muir Rd @ Pacheco Blvd.
22	CC09	Orinda	Moraga Wy @ Ivy Dr.
23	CC10	Pittsburg	Delta De Anza Trail @ Los Medanos/Alves
24	CC11	Richmond	MacDonald @ Marina
25	CC12	San Ramon	Executive Prkwy @ Camino Ramon
26	CC13	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd

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Figure 2C
COUNT AND SURVEY LOCATIONS - ALAMEDA AND CONTRA COSTA COUNTIES
378980/ALAMEDA-CC-1/09/03

NAPA COUNTY

NA01	American Canyon	SR29 @ American Canyon
NA02	Calistoga	Lincoln St (SR29) @ Washington St
NA03	County	Dry Creek @ Orchard
NA04	County	Old Sonoma Rd @ Carneros Hwy (Hwy 121)
NA05	Napa	Lincoln Ave @ Jefferson St
NA06	Napa	1st @ School Rd
NA07	Oakville	Silverado Trail @ Oakville Cross
NA08	St Helena	Main (SR29) @ Adams (St Helena Hwy)
NA09	Yountville	Finnell @ Yountville

SOLANO COUNTY

SL01	Benicia	Military West @ 2nd St.
SL02	County	Dixon-Davis Bike Route @ Vaughn Rd/Pedrick
SL03	Dixon	First St @ C St
SL04	Fairfield	Hwy 12-Jameson Canyon @ Red Top Rd
SL05	Fairfield	Travis @ Texas
SL06	Rio Vista	Downtown Waterfront Path
SL07	Suisun City	Main @ Lotz
SL08	Vacaville	Alamo @ Nut Tree
SL09	Vacaville	Downtown Creekwalk
SL10	Vallejo	Solano Bikeway @ Columbus Prkwy/Callaghan
SL11	Vallejo	Waterfront Path

SONOMA COUNTY

SN01	Cotati	Old Redwood Hwy @ Cotati Ave
SN02	Healdsburg	Healdsburg Ave @ Matheson St
SN03	Petaluma	A' St @ Howard St and 6th St
SN04	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy
SN05	Santa Rosa	2nd St @ Santa Rosa Ave
SN06	Santa Rosa	Mendocino Ave @ Pacific Ave
SN07	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St.)
SN08	Sonoma	Sonoma Hwy (Hwy 12) @ Verano
SN09	Sonoma	Broadway @ W. Napa St (Hwy 12)

NORTH
NOT TO SCALE

- Count Location
- Count Location with Extended Hours
- Count and Survey Location
- Count with Extended Hours and Survey Location

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Figure 2D
COUNT AND SURVEY LOCATIONS - SOLANO, NAPA AND SONOMA COUNTIES
378980\Solano-Napa - 1/9/03

APPENDIX D

TECHNICAL MEMORANDUM 3 – COUNT METHODOLOGY AND RESULTS

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

MEMO

SAN FRANCISCO OFFICE
December 18, 2002 Project Number: 378980

To: Trent Lethco, MTC Project Manager

From: Tim Erney / Carol Levine

Subject: MTC Bicycle and Pedestrian Data Collection Project
Technical Memorandum 3 – Count Methodology and Results

This memorandum presents the results of the bicyclist/pedestrian count component of the MTC Bicycle and Pedestrian Data Collection project. Included are a description of the count schedule, methodology/procedures and a brief summary of the count results. The complete results, summarized by location and county, were compiled in a computer database.

The purpose of this count effort was to determine the current usage levels at various types of bicycle and pedestrians facilities throughout the nine county region. The 101 count locations were developed using five criteria: high bicycle collision rates, on local or regional bicycle network (both existing and proposed), proximity to major transit facilities, proximity to schools and universities, and proximity to local or regional attractions/destinations (see Technical Memorandum #1). For each location, it was determined if bicycle-only, pedestrian-only or bicycle-pedestrian counts would be conducted.

Schedule
Counts were conducted throughout September and October of 2002. To ensure that that counts were conducted after the school year had begun, various schools (including elementary schools, high schools and colleges/universities) within each county were contacted regarding their start date. In addition, it was necessary for counts to be completed before the end of daylight savings time (October 27, 2002) to ensure that the entire evening count duration would be during sunlight. Based on these time constraints, a schedule for the counts was developed. Table 1 presents the count locations and the count schedule.

Following standard traffic counting methodology, counts were conducted on Tuesdays, Wednesdays and Thursdays only. Counts were planned for both the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods. For each period, the counts were conducted and recorded in 15-minute intervals.

In addition, the evening counts were expanded by two hours (2:00 to 4:00 PM) at selected locations near schools to capture the additional school-related activity (i.e., students leaving school at the end of the day). These counts were anticipated to represent a sample of the various school locations throughout the nine counties, to provide an estimate of the potential increase in activity due to school trips. The selection of school counts focused on middle schools, high schools or junior colleges located near the count locations, for three reasons. First, elementary schools are typically smaller and do not generate substantial bicycle and pedestrian traffic, as most students are picked-up or take a school bus. Second, colleges typically have classes throughout the day, and therefore do not have the same peaking of student activity between 2:00 and 4:00 PM. Third, since traffic tends to disperse out from a generator, only count locations within one or two blocks from schools would capture a substantial portion of the school-related traffic. In addition, it was desired to have representative counts throughout the nine counties, so only one location per county was considered. Overall, six extended afternoon count locations were selected, as shown in Table 1.

Methodology/Procedures

After the selection of the count locations, data collection supervisors performed site inspections at each location to observe intersection operations, record the intersection profiles (as described below), to determine the number of field technicians required to conduct the counts, and to determine the preferred location for the technician(s) to be stationed.

At the start of the project, it was estimated that one field technician would be required for each count at each location (i.e., one field technician for bicycle-only or pedestrian-only counts, but two field technicians for both bicycle-pedestrian counts). At the locations with observed high levels of pedestrian and bicycle activities (primarily those locations within San Francisco), at least two field technicians would be required. However, based on the observed activity levels at the count locations, and the anticipated ease of performing the counts, it was determined that each field technician would be able to count both bicyclist and pedestrians at most of the count locations. As a result, the counts were expanded to include bicycle and pedestrian volumes for all of the count locations except those in San Francisco.

Both bicycle and pedestrian counts were conducted on a leg-by-leg basis at the intersections. Bicyclists were counted as they approached the intersection and recorded for the appropriate leg (for example, a bicyclist traveling southbound towards the intersection was recorded on the north leg). Pedestrians were counted as they crossed the intersection and were recorded for the appropriate crosswalk (for example, a pedestrian crossing the street on the north side was record on the north leg). At locations where pedestrian scrambles were provided, or where pedestrians cut across the intersection, the pedestrians were recorded from where they entered the intersection. It should be noted that the actual direction of travel of the bicyclists and pedestrians were not recorded.

Since bicycle and pedestrian activity can be influenced by weather conditions, the weather forecasts for each week were examined for the locations scheduled to be counted that week. The counts were to be canceled for any day that inclement weather (e.g., rain or high winds)

occurred, or was forecasted to occur. Throughout the count duration, no scheduled counts were cancelled due to weather.

In addition, bicycle and pedestrian activity can be influenced by events and traffic conditions. For example, a major event, such as a county fair, may result in unusual activity levels in the nearby vicinity. In addition, a serious incident on the San Francisco-Oakland Bay Bridge may cause more commuters to use transit, which may increase the bicycle and pedestrian counts in the vicinity of transit stops. As such, the event calendars for each week were examined for the locations scheduled to be counted that week, and daily traffic reports were reviewed to ensure that any major traffic or transit incidents did not affect the schedule count locations. Throughout the count duration, no scheduled counts were cancelled due to events or traffic conditions.

At the beginning of each week, the supervisors met with the field technicians to assign the scheduled count locations for the week, to indicate where the field technicians should be stationed at each intersection, to provide data entry forms and counting equipment, and to review the count procedures. In addition, the field technicians were provided with the supervisor's contact information, in case of questions or problems.

On the day of the counts, field technicians were responsible for their travel to and from the count locations. Throughout both the morning and evening counts, the supervisors traveled between their assigned count locations to ensure that the field technicians were in place, the counts were being properly conducted, and to pick up the completed data entry forms. It should be noted that on days when the count locations were spread out, the supervisors remained at designated locations and the count technicians traveled to and from the supervisors.

Intersection Profiles Forms: To record the current configuration of the count locations, intersection profile forms were created (see attached). These forms had two sections: a schematic of the intersection, including lane geometries and adjacent building/activities; and an intersection feature checklist. The checklist included information on the intersection geometry (intersection control, presence of sidewalks and bicycle lanes), lane configuration/signal phasing (number of lanes and presence of exclusive left-turn or right-turn phases), physical features (presence and configuration of medians), pedestrian signals (presence of pedestrian signal heads, type of pedestrian control) and detectors (pedestrian push buttons and ADA compliance). In addition, the forms included the date when the information was collected, and the name of the person who filled out the form.

Data Entry Forms: To record the number of bicyclists and/or pedestrians, data entry forms were created (see attached). These forms included the time periods (divided into 15-minute intervals) and the four legs of the intersection (north leg, south leg, east leg and west leg). The 15-minute bicycle/pedestrian counts for each leg were recorded, and the totals for the two-hour periods were calculated.

Results

In general, during both the morning and evening periods, the pedestrian counts were substantially higher than the bicycle counts. Overall, the bicycle counts represented about 16 percent of the total counts during both time periods. In addition, the total evening counts were somewhat higher than the total morning counts (23,085 versus 19,345). This temporal distribution is consistent with typical traffic and bicycle/pedestrian count results, since the morning period tends to be mostly commute traffic, while the evening period tends to have both commute and other (primarily shopping) traffic.

Both the bicycle and pedestrian counts were the highest in San Francisco County and the lowest in Solano County. The counts in the other seven counties were relatively equal. However, Napa County had some locations with low volume totals.

In addition, the bicycle and pedestrian counts for the extended school period (2:00 to 4:00 PM) were equal to, or greater than, both the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) counts at the location.

Data Summary

The information from the intersection profile forms and the data entry forms were entered into a computer database. The database included a separate page for each count location (which presented the intersection profile, the day and date the counts were performed, and the 15-minute and total period counts), and bicycle/pedestrian count summaries by county and for the entire nine-county region.

The database was designed to be expandable. When additional counts are conducted, the results can be entered into the database, and the result will be included in the county and region summaries.

Survey Administration Methodology

In addition to the bicycle/pedestrian counts, the field technicians were responsible for distributing the bicyclist/pedestrian surveys (see Technical Memorandum #1 and #4). An additional field technician was assigned for each location where surveys were to be distributed. These field technicians were involved in the weekly supervisor meetings, to discuss survey administration procedures. In addition, the survey administrators were provided with a brief explanation of the project to present to the potential survey respondents.

At the beginning of each day, the survey administrators were provided between 100 and 150 surveys to distribute, based on the observed activity levels at their specific location (the number of surveys provided at each location was recorded). Approximately half of the surveys were to be distributed in the morning period and the other half were to be distributed in the evening period. At the end of the day, any unused surveys were returned to the supervisors, and the total surveys handed out were recorded.

The survey administrators were stationed at the busiest corner of the intersection and asked passing bicyclists and pedestrians if they would be interested in filling out a brief survey for MTC. Only those bicyclists and pedestrians who were interested in filling out the survey were handed a copy of the survey. In addition, the survey administrators walked around the intersection if survey location was not very active, in order to capture more bicyclists and pedestrians.

Technical Memorandum #4 presents a description of the survey development and administration and a brief summary and analysis of the survey results.

MTC Bicycle/Pedestrian Data Collection Project

Summary of Count Results

Alameda County

Jurisdiction	Intersection	Count Date	AM Counts		PM Counts	
			Bikes	Peds	Bikes	Peds
Alameda	Otis @ Park	September 26, 2002	20	85	58	272
Berkeley	Hearst @ Oxford	September 26, 2002	111	398	124	412
Berkeley	Virginia @ San Pablo	September 26, 2002	59	78	69	103
Dublin	Iron Horse @ Dublin Blvd	October 3, 2002	11	19	17	25
Emeryville	Powell St @ Christie	September 26, 2002	9	20	7	68
Fremont	Fremont Blvd @ Mowry	October 3, 2002	50	127	90	205
Hayward	Winton @ Amador	October 3, 2002	20	126	18	94
Livermore	Wente St/Concannon @ Livermore Ave	October 2, 2002	1	8	16	2
Oakland	Grand Av @ Staten Av	September 26, 2002	52	387	48	571
Oakland	66th @ San Leandro	September 26, 2002	67	143	63	91
Pleasanton *	Bernal @ Main	October 3, 2002	26	44	11	165
San Leandro	Bancroft @ Estudillio	October 3, 2002	20	429	20	118
Union City	Alvarado-Niles @ Decoto	October 3, 2002	35	121	37	193

Contra Costa County

Jurisdiction	Intersection	Count Date	AM Counts		PM Counts	
			Bikes	Peds	Bikes	Peds
Antioch	L St. @ 18th St	October 2, 2002	24	524	17	95
Brentwood *	Brentwood Blvd @ Oak	October 2, 2002	5	10	9	26
Concord	Grant @ Concord Blvd	September 25, 2002	20	170	28	149
County/P.H.	Coggins and Jones @ Treat	September 25, 2002	51	237	53	231
Danville	Railroad Ave @ Hartz/Danville Blvd	September 26, 2002	5	70	8	21
El Cerrito	Ohlone Trail @ Fairmount Ave	September 26, 2002	103	462	99	479
Lafayette	Mt. Diablo @ Moraga Rd	September 26, 2002	15	336	38	86
Martinez	Muir Rd @ Pacheco Blvd	September 24, 2002	3	10	3	5
Orinda	Moraga Wy @ Ivy Dr	September 23, 2002	3	310	8	66
Pittsburg	Delta De Anza Trail @ Los Medanos	October 2, 2002	5	48	8	20
Richmond	MacDonald @ Marina	September 26, 2002	8	333	65	399
San Ramon	Executive Prkwy @ Camino Ramon	September 25, 2002	5	108	3	124
Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	September 25, 2002	29	171	22	23

Marin County

Jurisdiction	Intersection	Count Date	AM Counts		PM Counts	
			Bikes	Peds	Bikes	Peds
C. Madera	Camino Alto @ Madera/Chapman	October 10, 2002	51	47	32	27
Fairfax	Pacheco @ Center/Broadway	October 10, 2002	57	67	110	92
Larkspur	E. S.F. Drake @ Larkspur Landing	October 9, 2002	54	66	26	115
Novato	Grant @ 7th St	October 9, 2002	13	80	14	130
Novato	Alameda del Prado/Nave Dr	October 10, 2002	9	70	22	66
San Rafael	4th St @ Lincoln Ave	October 9, 2002	41	217	35	221
San Rafael	B St @ 2nd St	October 9, 2002	21	158	23	408
Sausalito	Bridgeway @ Princess	October 9, 2002	61	287	89	684
Mill Valley	Mill Valley Path @ E. Blithdale	October 10, 2002	96	54	74	55
Tiburon	Main St @ Tiburon Blvd	October 10, 2002	41	295	21	356
Mill Valley	101 @ Seminary	October 10, 2002	19	18	7	34

* Extended afternoon counts were also conducted at this location.

MTC Bicycle/Pedestrian Data Collection Project

Summary of Count Results

Napa County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
American Canyon	SR 29 @ American Canyon	September 19, 2002	2	5	6	4
Calistoga	Lincoln St (SR 29) @ Washington St	September 18, 2002	9	263	38	738
County	Dry Creek @ Orchard	September 19, 2002	6	15	25	0
County	Old Sonoma Rd @ 121	September 19, 2002	0	0	0	0
Napa	Lincoln Ave @ Jefferson St	September 19, 2002	27	65	39	56
Napa	1st @ School Rd	September 19, 2002	10	133	41	382
Oakville	Siverado Trail @ Oakville Cross	September 19, 2002	1	0	2	0
St Helena	Main (SR 29) @ Adams (St. Helena Hwy)	September 19, 2002	5	106	25	365
Yountville	Finnell @ Yountville	September 18, 2002	9	96	29	39

San Francisco County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
San Francisco	3rd St @ Howard	October 8, 2002	-	2,227	-	2,698
San Francisco	Embarcadero @ Washington	October 8, 2002	115	318	181	516
San Francisco	Seventh @ Folsom	October 9, 2002	207	810	151	789
San Francisco	Geary @ Divisadero	October 9, 2002	-	1,157	-	1,436
San Francisco	GG Park Panhandle @ Baker St	October 9, 2002	114	-	147	-
San Francisco	Haight @ Scott	October 8, 2002	183	-	286	-
San Francisco	Van Ness @ Turk	October 8, 2002	43	-	75	-
San Francisco	Ocean @ Geneva	October 9, 2002	-	266	-	323
San Francisco	3rd St @ 16th St	October 8, 2002	27	-	46	-

San Mateo County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
Belmont	Ralston @ 6th	October 9, 2002	12	83	5	70
Burlingame	California Dr @ Lincoln Ave	October 10, 2002	11	19	8	10
Daly City	John Daly Blvd @ Lake Merced Blvd	October 8, 2002	14	81	13	179
Daly City	Mission @ E. Market	October 8, 2002	3	111	12	257
East Palo Alto	University @ Bay Road	October 9, 2002	24	182	43	257
Foster City	Hillsdale Blvd @ Edgewater Blvd	October 10, 2002	29	52	29	57
Half Moon Bay	Main @ Correas	October 9, 2002	11	75	23	100
Millbrae *	Millbrae @ Magnolia	October 8, 2002	7	94	5	34
Pacifica	Francisco @ Paloma	October 8, 2002	15	93	2	103
Redwood City	Main @ Middlefield	October 10, 2002	45	40	46	101
Redwood Shores	Redwood Shores @ Twin Dolphin	October 9, 2002	17	20	10	25
San Bruno	El Camino @ Sneath	October 8, 2002	13	127	19	118
San Mateo	Delaware St @ 3rd Ave	October 9, 2002	53	181	49	147
South SF	Grand @ Airport Blvd	October 8, 2002	28	124	27	105

* Extended afternoon counts were also conducted at this location.

MTC Bicycle/Pedestrian Data Collection Project

Summary of Count Results

Santa Clara County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
Campbell	Bascom @ Hamilton	October 8, 2002	64	30	59	71
Cupertino *	Stevens Creek @ De Anza	October 9, 2002	23	67	41	108
Gilroy	Monterey @ 7th St	October 15, 2002	39	109	30	119
Milpitas	Dixon Landing @ Milpitas	October 15, 2002	8	44	9	40
Morgan Hill	Monterey @ Main (El Camino Real)	October 8, 2002	18	83	17	52
Mountain View	California St @ Escuela Av	October 9, 2002	104	589	92	307
Palo Alto	Foothill @ Page Mill	October 10, 2002	63	1	82	8
Palo Alto	University @ Emerson	October 8, 2002	80	295	42	557
San Jose	San Fernando @ 7th	October 9, 2002	20	631	39	674
San Jose	Santa Clara @ Montgomery	October 8, 2002	18	114	32	111
Santa Clara	El Camino Real @ Railroad	October 10, 2002	20	34	23	45
Santa Clara	Homestead Rd @ Kiely Blvd	October 9, 2002	23	107	27	121

Solano County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
Benicia *	Military West @ 2nd St	October 1, 2002	3	19	0	15
County	Dixon-Davis Bike Route @ Vaughn	September 12, 2002	0	0	0	3
Dixon	First Street @ C St	September 12, 2002	8	62	10	17
Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	October 2, 2002	0	0	0	1
Fairfield	Travis @ Texas	October 2, 2002	17	94	33	95
Rio Vista	Downtown Waterfront Path	September 18, 2002	0	5	2	23
Suisun City	Main @ Lotz	October 2, 2002	3	35	1	55
Vacaville	Alamo @ Nut Tree	October 2, 2002	48	95	38	60
Vacaville	Downtown Creekwalk	October 1, 2002	37	75	47	159
Vallejo	Solano Bikeway @ Columbus Prkwy	October 2, 2002	0	2	4	0
Vallejo	Waterfront Path	October 1, 2002	0	64	0	123

Sonoma County

			AM Counts		PM Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**	**Bikes**	**Peds**
Cotati	Old Redwood Hwy @ Cotati Ave	September 25, 2002	16	27	29	35
Healdsburg	Healdsburg Ave @ Matheson St	September 11, 2002	16	51	32	243
Petaluma	A St @ Howard St and 6th St	September 25, 2002	3	4	13	42
Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	September 24, 2002	4	0	13	2
Santa Rosa	2nd St @ Santa Rosa Ave	September 24, 2002	12	154	34	317
Santa Rosa *	Mendocino Ave @ Pacific Ave	September 24, 2002	66	413	64	230
Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	September 24, 2002	14	120	20	366
Sonoma	Hwy 12-Sonoma Hwy @ Verano	September 25, 2002	32	38	38	25
Sonoma	Broadway @ W. Napa St (12)	September 25, 2002	17	69	41	235

* Extended afternoon counts were also conducted at this location.

Extended School Counts

			Afternoon Counts	
Jurisdiction	**Intersection**	**Count Date**	**Bikes**	**Peds**
Pleasanton	Bernal @ Main	October 3, 2002	20	152
Brentwood	Brentwood Blvd @ Oak	October 2, 2002	4	36
Millbrae	Millbrae @ Magnolia	October 8, 2002	7	115
Cupertino	Stevens Creek @ De Anza	October 9, 2002	32	127
Benicia	Military West @ 2nd St	October 1, 2002	6	11
Santa Rosa	Mendocino Ave @ Pacific Ave	September 24, 2002	62	656

APPENDIX E

TECHNICAL MEMORANDUM 4 – SURVEY METHODOLOGY AND RESULTS

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

MEMO

SAN FRANCISCO OFFICE
December 19, 2002 Project Number: 378980

To: Trent Lethco, MTC Project Manager

From: Tim Erney / Carol Levine

Subject: MTC Bicycle and Pedestrian Data Collection Project
Technical Memorandum 4 – Results of Bicyclist/Pedestrian Survey

This memorandum presents the results of the bicyclist/pedestrian survey component of the MTC Bicycle and Pedestrian Data Collection project. Included are a description of the survey development and administration and a brief summary and analysis of the survey results. The complete results, on a question-by-question basis, are attached. In addition, recommendations to improve and enhance the survey responses and analysis are included.

The purpose of this survey effort was to obtain information on the travel patterns and characteristics of bicyclists and pedestrians throughout the nine county region, including origin/ destination information, trip purpose, auto ownership, age, frequency of traveling by bicycle or by walking, use of bicycles as an access mode to transit, and safety issues. The survey instrument (see attached) was developed by MTC staff and was in a pre-paid mail-back format, where the respondent dropped the survey in a mailbox after completion.

Two survey locations per county were selected to administer the surveys, based on the final list of count locations (see Technical Memorandum #1) and the locations in each county which appeared to have the highest activity levels, as observed during preliminary field assessments. The completed surveys were returned to MTC and forwarded to WSA for data entry, reduction and analysis.

Survey Administration Methodology
The goal of the survey effort was to have returned 500 surveys, which was assumed to provide about 400 valid survey responses. Based on previous experience, it was assumed that there would be an average return rate of 25 percent, which would require the distribution of 2,000 surveys. As such, the target was to distribute 100 surveys at 20 survey locations, with basically two locations per county. Since each count location had different amount of activity, the maximum number of surveys to be distributed per location was limited to 150. Table 1 presents the location of the surveys and the number of surveys distributed at each location.

Table 1
Survey Distribution

County	Jurisdiction	Location	# Distributed
Alameda County	Berkeley	Hearst @ Oxford	150
	Emeryville	Powell @ Christie	55
Contra Costa County	Concord	Grant @ Concord Blvd.	150
	Lafayette	Mt. Diablo @ Moraga	150
Marin County	Larkspur	East St. Francis Drake @ Larkspur Ld	150
	San Rafael	B @ 2nd	150
Napa County	Calistoga	Lincoln (SR 29) @ Washington	92
	Napa	Lincoln @ Jefferson	88
San Francisco County	San Francisco	The Embarcadero @ Washington	150
	San Francisco	Ocean @ Geneva	150
San Mateo County	Millbrae	Millbrae @ Magnolia	78
	Redwood City	Main @ Middlefield	150
Santa Clara County	Palo Alto	Foothill @ Page Mill	77
	Santa Clara	El Camino Real @ Railroad	129
Solano County	Fairfield	Travis @ Texas	150
	Vacaville	Alamo @ Nut Tree	150
Sonoma County	Santa Rosa	2nd @ Santa Rosa Ave.	112
	Sonoma	Broadway @ W. Napa St. (SR 12)	104
Total			**2,235**

Surveys were administered during the ongoing bicycle/pedestrian counts (throughout September and October of 2002, on Tuesdays, Wednesdays and Thursdays between 7:00 and 9:00 AM and between 4:00 and 6:00 PM) and were distributed to passing pedestrians and bicyclists. A separate field technician was responsible for distributing the bicyclist/pedestrian surveys at each location. Prior to each week of counts and surveys, count supervisors held meetings with the survey administrators to discuss survey administration procedures. In addition, the survey administrators were provided with a brief explanation of the project to present to the potential survey respondents.

At the beginning of each day, the survey administrators were provided between 100 and 150 surveys to distribute, based on the observed activity levels at their specific location (the number of surveys provided at each location was recorded). Approximately half of the surveys were to be distributed in the morning period and the other half were to be distributed in the evening period. At the end of the day, any unused surveys were returned to the supervisors, and the total surveys handed out were recorded.

The survey administrators were stationed at the busiest corner of the intersection and asked passing bicyclists and pedestrians if they would be interested in filling out a brief survey for MTC. Only those bicyclists and pedestrians who were interested in filling out the survey were handed a copy of the survey. In addition, the survey administrators walked around the

intersection if survey location was not very active, in order to capture more bicyclists and pedestrians.

Survey Response Rate

Overall, 2,235 surveys were distributed at 18 locations. Out of these, 128 completed surveys were returned, which corresponds to a response rate of about 6 percent. Of these returned surveys, 76 respondents (60 percent) answered the questions related to walking, 31 respondents (24 percent) answered the questions related to bicycling, and 21 respondents (16 percent) answered the questions for both walking and bicycling.

It should be noted that the respondents who answered both the walking and bicycling questions were not eliminated from the results. Since the survey did not specifically direct the respondents to fill out the section applicable to their mode of travel when handed the survey, some respondents filled out both sections if they were both bicycling and walking during the day. Also, some respondents were confused as to the meaning of a "trip", and answered their questions as a round-trip instead of a one-way trip. These responses were not eliminated from the results, as the survey did not explain the differences between one-way and round-trip trips.

In addition, it should be noted that the survey results presented herein were not weighted. Typically, the number of pedestrians/bicyclists at each location are compared to the number of surveys distributed and the number of surveys returned, and the results are adjusted to account for the level of activity and response rates. This allows each survey to represent a certain percentage of the population, which results in more accurate characteristics. For this survey, the results were not weighted due to the low response rate, and because it was not possible to know which completed survey was handed out at which location.

Survey Results

The results of the survey are included at the end of this memorandum. The following sections present the general results for each of the six survey categories. It should be noted that the results for the "About You", "About Your Trip Today", "Your Accident Experience" and "Comments" categories are based on the total number of surveys returned (130), whereas the results for the "If You Are Walking Today" and "If You Area Pedestrian Today" categories are based on the number of walk surveys returned (97) and bicycle surveys returned (52), respectively.

About You –

In general, the people who responded to the survey were relatively evenly split between males and females, were within the 16-39 and 40-64 age groups, and were relatively evenly split between the four income levels. Most of those surveyed owned a vehicle (about 70 percent), although 8 percent did not answer the question.

About Your Trip Today –

The primary trip purpose of those surveyed was the commute to work, with relatively even percentages for the other purposes. On average, the people who responded to the survey used

1.5 other modes of transportation on their trips, primarily walk and auto. Most of the trips (about 83 percent of those surveyed) started at home, and the majority of the trips ended at work (about 52 percent of those surveyed) or at home (about 31 percent of those surveyed). For about 48 percent of those surveyed, the origin and destination of their trip was within the same county, although a substantial number of respondents did not answer the question. Inter-county travel was primarily between Alameda, Contra Costa and San Francisco counties.

Accident Experience –

About 23 percent of those surveyed had been involved in a crash or accident while walking or bicycling. Of those, about 77 percent suffered little or no injury. The majority of accidents were not reported to the police.

If You Are Walking Today –

Respondents tended to walk frequently and for long duration, as about 25 percent of those surveyed walked less than 10 minutes per day, about 28 percent of those surveyed walked between 10 and 30 minutes per day, and about 31 percent of those surveyed walked over 30 minutes per day. For both the between 10 and 30 minutes and the over 30 minutes categories, most respondents walked this duration five times or more per week.

Respondents tended to feel safe when crossing the street, as 65 percent of those surveyed ranked their safety between 6 and 10 (with 10 being very safe). In addition, respondents tended to feel that the pedestrian signals provided sufficient crossing time.

The majority of the respondents correctly answered the questions regarding the rules of the road.

It should be noted that the majority of the respondents felt that tickets should be issued to pedestrians for unlawful behavior (about 63 percent of those surveyed), whereas most respondents (about 84 percent of those surveyed) admitted to jaywalking at least sometimes.

If Are Bicycling Today –

On average, respondents chose to bicycle for about three to four reasons, primarily for personal reasons (exercise/recreation, health, protect the environment). In addition, a substantial portion of the respondents chose to bicycle because it was more convenient or saved time. Relatively few respondents bicycled because parking was not available or they did not have a car available.

Most of the respondents used their bicycles regularly (about 92 percent of those surveyed used it several times a week or more). Of those, most riders traveled for a short distance or time (about 64 percent of those surveyed rode their bicycle for 5 miles or less). About 42 percent of those surveyed used public transit at least a few times a week, but did not often take their bicycles on transit.

In terms of preferences for types of facilities, respondents preferred to ride on bicycle trails, followed by painted bicycle lanes, identified bicycle routes and city streets, although a substantial number of respondents did not answer these questions.

Respondents tended to feel safe when bicycling, as about 62 percent of those surveyed ranked their safety between 6 and 10 (with 10 being very safe). In addition, respondents tended to feel that more bicycle trails and paths, or bicycle lanes on the street would make them feel more safe. Conversely, having motorists follow the rules of the road or slower-moving cars would not make respondents feel substantially more safe.

The majority of the respondents correctly answered the questions regarding the rules of the road.

It should be noted that the majority of the respondents felt that tickets should be issued to bicyclists for unlawful behavior (about 67 percent of those surveyed), whereas almost all respondents (about 91 percent of those surveyed) admitted to not stopping at STOP signs at least some of the time. In addition, about 63 percent of those surveyed generally wear a helmet when riding.

Comments –
Comments primarily addressed a need to improve awareness and courtesy between motorists, bicyclists and pedestrians, such as yielding right-of-way, following the rules of the road and enforcement. In addition, another respondents wanted to improve bicycle and pedestrian facilities, such as increasing the amount of time to cross intersections and eliminating STOP signs along bicycle routes.

Analysis
To determine if there was any significant correlation among the survey responses, several cross-tabulations were performed. These cross-tabulations were conduced between the respondent demographics (i.e., gender, age and income) and the survey results (i.e., trip purpose, walking and bicycling responses), and between the different survey results. For instance, it was assessed whether there was a significant relationship between respondent gender and the use of a helmet, or between trip purpose and the length/time of the bicycle ride.

Overall, the cross-tabulations did not result in any significant findings for the survey respondents. In general, there was no direct correlation between the various survey responses (e.g., frequent bicycles users were not more likely to use public transit), or the relationships were expected (e.g., older respondents did not jaywalk as much as younger respondents). It should be noted that these conclusions are only applicable to the survey respondents, not overall population in each county.

Recommendations
Based on the survey results and the survey administration and analysis procedures, the following recommendations have been developed to improve future survey efforts:

1. The survey could address a specific project or issue that participants can recognize, support and respond to. General surveys typically have lower response rates than ones for a specific purpose.

2. The option to fill out a survey on-line could be included. Also, a link to MTC and/or bicycle and pedestrian projects could be included.
3. A key or serial number could be added to each individual survey form so that the location and time the survey was handed out could be recorded. Without this information, it is not possible to accurately weigh the survey results.
4. A question could be added asking where the respondent lives. Although the survey does ask where the trip started and ended, it is not possible to relate that information to where the respondent lives or where the respondent received the survey. Combined with a key or serial number (see #3), this would allow the commute patterns of the respondents to be determined.
5. The sections regarding whether the respondent was walking or bicycling were often incorrectly answered, since it was not clear that the respondent was supposed to fill out the section corresponding to the mode used when they were surveyed. As such, either separate survey forms could be handed out for bicyclists and pedestrians, or the section headings could to be expanded.
6. Several respondents did not understand that a "trip" is a one-way trip, not a round-trip. This distinction could be clarified.
7. To make it easier to distribute separate bicyclist and pedestrian forms, and to allow for clarification to survey questions, the surveys could be administered as intercept surveys. An added benefit to intercept surveys is that the number of responses can be tracked, and the survey effort can be continued under the target is met. However, intercept surveys can be difficult to administer and should have fewer questions.
8. Questions asking the respondent to use a 1 to 10 scale are difficult to analyze, since respondents may have a different value for each number. As such, an average value has limited meaning. Therefore, the 1 to 10 scale could be replaced with a text scale (e.g., very safe, somewhat safe, etc.).
9. The questions that had low response rates could be revised or eliminated. For example, question W1 had low completion rates, as respondents may not have known to answer each of the three categories of responses. Instead, most respondents only answered one category (e.g., walked over 30 minutes five or more times per week). In addition, a substantial portion of the respondents did not answer questions B6 and B10 correctly by ranking their preferences. Most respondents only chose one of the four options, instead of ranking them.

MTC Bicycle/Pedestrian Data Collection Project
Summary of Survey Results

About You…

1. Gender

	Number	Percentage
Male	67	52%
Female	61	47%
No response	2	2%
Total	**130**	**100%**

2. Age

	Number	Percentage
Under 16	0	0%
16-39	62	48%
40-64	57	44%
65+	7	5%
No response	4	3%
Total	**130**	**100%**

3. Household income

	Number	Percentage
Under $25,000	32	25%
$25K-49,999	20	15%
$50K-74,999	28	22%
$75,000+	43	33%
No reponse	7	5%
Total	**130**	**100%**

4. Do you own a car?

	Number	Percentage
Yes	92	71%
No	27	21%
No response	11	8%
Total	**130**	**100%**

About Your Trip Today…

5. Primary purpose of trip?

	Number	Percentage
Work	68	52%
Recreation	22	17%
School	18	14%
Shopping	13	10%
Other	6	5%
No response	3	2%
Total	**130**	**100%**

6. Other modes used on this trip?

	Number	Percentage
Walk	60	46%
Bicycle	28	22%
Motorcycle	2	2%
Auto	42	32%
Bus	23	18%
BART	20	15%
Other Rail	6	5%
Ferry	11	8%
No response	0	0%
Total	**192**	**148%**

7. Where did you start trip today?

	Number	Percentage
Home	108	83%
Work	12	9%
School	2	2%
Other	4	3%
No response	4	3%
Total	**130**	**100%**

Other responses - Hotel, Store, Out of town

8. Where did you end trip today?

	Number	Percentage
Home	40	31%
Work	67	52%
School	11	8%
Other	6	5%
No response	6	5%
Total	**130**	**100%**

Other responses - Hotel, Store

MTC Bicycle/Pedestrian Data Collection Project

Summary of Survey Results

Start of Trip (#7 continued)

County	Number	Percentage
Alameda	29	22%
Contra Costa	17	13%
Marin	7	5%
Napa	4	3%
San Francisco	21	16%
San Mateo	14	11%
Santa Clara	6	5%
Solano	3	2%
Sonoma	5	4%
No response	24	18%
Total	**130**	**100%**

City	Number	Percentage
Alameda	5	4%
Albany	1	1%
Antioch	1	1%
Berkeley	16	12%
Burlingame	1	1%
Calistoga	1	1%
Concord	9	7%
Cupertino	1	1%
Daly City	1	1%
Emeryville	1	1%
Fairfield	2	2%
Foster City	1	1%
Fremont	2	2%
Glen Ellen	1	1%
Greenbrae	1	1%
Hayward	1	1%
Lafayette	4	3%
Larkspur	1	1%
Martinez	1	1%
Menlo Park	1	1%
Mill Valley	1	1%
Millbrae	2	2%
Mountain View	3	2%
Napa	3	2%
Novato	1	1%
Oakland	3	2%
Palo Alto / East Palo Alto	4	3%
Petaluma	1	1%
Pleasant Hill	1	1%
Portland	1	1%
Redwood City	4	3%
Ross	1	1%
San Francisco	21	16%
San Mateo	1	1%
San Rafael	1	1%
Santa Rosa	2	2%
Sonoma	1	1%
Tiburon	1	1%
Union City	1	1%
Vallejo	1	1%
Woodside	1	1%
No response	23	18%
Total	**130**	**100%**

End of Trip (#8 continued)

County	Number	Percentage
Alameda	21	16%
Contra Costa	11	8%
Marin	4	3%
Napa	4	3%
San Francisco	32	25%
San Mateo	9	7%
Santa Clara	10	8%
Solano	2	2%
Sonoma	4	3%
No reponse	33	25%
Total	**130**	**100%**

City	Number	Percentage
Alameda	1	1%
Berkeley	15	12%
Calistoga	1	1%
Concord	7	5%
Cupertino	1	1%
Emeryville	1	1%
Fairfield	1	1%
Greenbrae	1	1%
Lafayette	4	3%
Larkspur	1	1%
Menlo Park	1	1%
Millbrae	2	2%
Mountain View	1	1%
Napa	3	2%
Oakland	4	3%
Palo Alto	8	6%
Redwood City	2	2%
San Carlos	2	2%
San Francisco	32	25%
San Mateo	1	1%
San Rafael	2	2%
Santa Rosa	2	2%
Sonoma	2	2%
Vallejo	1	1%
Woodside	1	1%
No response	33	25%
Total	**130**	**100%**

MTC Bicycle/Pedestrian Data Collection Project
Summary of Survey Results

About Your Accident Experience…

9. Have you been involved in an accident?

	Number	Percentage
Yes	30	23%
No	94	72%
No response	6	5%
Total	**130**	**100%**

10. What was the extent of injury?

	Number	Percentage
None/Property	11	37%
Minor	12	40%
Serious	6	20%
No response	1	3%
Total	**30**	**100%**

11. Was accident reported to the police?

	Number	Percentage
Reported	8	27%
Not Reported	18	60%
No response	4	13%
Total	**30**	**100%**

Comments…

Number	Comment
5	Motorists do not yield right-of-way to pedestrians/bikes
4	Better enforcement of motorists, bicyclists and pedestrians
3	Bicyclists on Embarcadero sidewalk a hazard
2	Bicyclists should follow rules of the road unless safe for them not to
2	Get bicyclists off sidewalks
2	Motorists need to be more aware of pedestrians/bikes
1	Bicyclists don't obey the rules of the road
1	Crossing time needs to be longer at intersections
1	Crosswalks not safe
1	Do not issue jaywalking tickets/Pedestrians should be able to cross when they please
1	Improve bike lanes to transit hubs
1	Keep other vehicles/joggers out of bike lanes
1	Motorists think bicyclists should be on the sidewalk
1	Only issue tickets if person is posing an immediate risk to themselves or someone else
1	Stop red light running
1	Too many stop signs on bike routes

MTC Bicycle/Pedestrian Data Collection Project

Summary of Survey Results

If You Are Walking Today...

W1. How many times a week do you walk for:

Less than 10 minutes?

	Number	Percentage
1-2	5	5%
3-4	5	5%
5+	24	25%
No response	63	65%
Total	**97**	**100%**

10-30 Minutes?

	Number	Percentage
1-2	8	8%
3-4	15	15%
5+	27	28%
No response	47	48%
Total	**97**	**100%**

Over 30 Minutes?

	Number	Percentage
1-2	12	12%
3-4	9	9%
5+	30	31%
No response	46	47%
Total	**97**	**100%**

W2. How safe do you feel when crossing street?

	Number	Percentage
(Not safe at all) 1	4	4%
2	6	6%
3	8	8%
4	5	5%
5	10	10%
6	8	8%
7	16	16%
8	20	21%
9	11	11%
(Very safe) 10	9	9%
No response	0	0%
Total	**97**	**100%**

W3. What is meaning of flashing hand?

	Number	Percentage
Don't start	83	86%
Hurry up	10	10%
Not sure	3	3%
No response	1	1%
Total	**97**	**100%**

W4. When OK to cross midblock?

	Number	Percentage
Never	21	22%
Marked crosswalk	53	55%
No traffic	19	20%
Whenever	1	1%
No response	3	3%
Total	**97**	**100%**

W5. Should police issue tickets to pedestrians?

	Number	Percentage
Yes	61	63%
No	30	31%
No response	6	6%
Total	**97**	**100%**

W6. When is it OK to cross against red light?

	Number	Percentage
Never	74	76%
No traffic	15	15%
No traffic and almost green	5	5%
When others do it	0	0%
No response	3	3%
Total	**97**	**100%**

W7. Do you jaywalk?

	Number	Percentage
Never	14	14%
Sometimes	55	57%
Often	17	18%
All the time	9	9%
No response	2	2%
Total	**97**	**100%**

W8. Your behavior when you cross the street?

	Number	Percentage
Don't pay attention	15	15%
Wait for signal - watch	72	74%
Wait for signal - don't watch	8	8%
No response	2	2%
Total	**97**	**100%**

W9. At intersections with ped signals, are peds generally given enough time to cross the street?

	Number	Percentage
Yes	54	56%
No	33	34%
No reponse	10	10%
Total	**97**	**100%**

MTC Bicycle/Pedestrian Data Collection Project

Summary of Survey Results

If You Are Bicycling Today...

B1. Why did you bicycle today?

	Number	Percentage
No car available	13	25%
Saves time	24	46%
Parking not available	6	12%
Parking too expensive	12	23%
Exercise/recreation	38	73%
More convenient	26	50%
Protect the environment	28	54%
For my health	32	62%
No response	0	0%
Total	**179**	**344%**

B2. How often do you use your bicycle?

	Number	Percentage
2+ times day	24	46%
Several times a week	24	46%
Several times a month	1	2%
Several times a year	2	4%
No response	1	2%
Total	**52**	**100%**

B3. How far did you ride your bicycle?

	Number	Percentage
0-2 miles / 0-10 minutes	14	27%
3-5 miles / 10-20 minutes	19	37%
6-8 miles / 21-30 minutes	9	17%
9+ miles / 30+ minutes	8	15%
No response	2	4%
Total	**52**	**100%**

B4. How often do you use public transit?

	Number	Percentage
Never	9	17%
Few times a month	16	31%
Few times a week	12	23%
Every day	15	29%
No response	0	0%
Total	**52**	**100%**

B5. Do you take your bike on transit?

	Number	Percentage
Never	23	44%
Few times a month	14	27%
Few timesa week	4	8%
Every day	10	19%
No response	1	2%
Total	**52**	**100%**

B6. I prefer to ride my bike:

On any city street.

	Number	Percentage
(most preferred) #1	3	6%
#2	2	4%
#3	4	8%
(least preferred) #4	29	56%
No response	14	27%
Total	**52**	**100%**

On streets identified as Bike Routes.

	Number	Percentage
(most preferred) #1	7	13%
#2	9	17%
#3	21	40%
(least preferred) #4	2	4%
No response	13	25%
Total	**52**	**100%**

On streets with painted Bike Lane.

	Number	Percentage
(most preferred) #1	23	44%
#2	21	40%
#3	1	2%
(least preferred) #4	0	0%
No response	7	13%
Total	**52**	**100%**

On off-street Bicycle Trails.

	Number	Percentage
(most preferred) #1	25	48%
#2	7	13%
#3	6	12%
(least preferred) #4	3	6%
No response	11	21%
Total	**52**	**100%**

B7. Additional car in household?

	Number	Percentage
Yes	14	27%
No	34	65%
No response	4	8%
Total	**52**	**100%**

B8. Do you generally wear a helmet?

	Number	Percentage
Yes	33	63%
No	16	31%
No response	3	6%
Total	**52**	**100%**

MTC Bicycle/Pedestrian Data Collection Project

Summary of Survey Results

B9. How safe do you feel when biking?

	Number	Percentage
(Not safe at all) 1	2	4%
2	2	4%
3	3	6%
4	4	8%
5	8	15%
6	4	8%
7	14	27%
8	8	15%
9	1	2%
(Very safe) 10	5	10%
No response	1	2%
Total	**52**	**100%**

B10. What would make you feel safer:

Bike lane?

	Number	Percentage
(safest) #1	19	37%
#2	14	27%
#3	8	15%
(least safe) #4	2	4%
Other	1	2%
No response	8	15%
Total	**52**	**100%**

More trails or paths?

	Number	Percentage
(safest) #1	24	46%
#2	6	12%
#3	10	19%
(least safe) #4	3	6%
Other	1	2%
No response	8	15%
Total	**52**	**100%**

Motorists following rules of the road?

	Number	Percentage
(safest) #1	13	25%
#2	10	19%
#3	9	17%
(least safe) #4	13	25%
Other	0	0%
No response	7	13%
Total	**52**	**100%**

Slower moving cars?

	Number	Percentage
(safest) #1	8	15%
#2	7	13%
#3	10	19%
(least safe) #4	17	33%
Other	0	0%
No response	10	19%
Total	**52**	**100%**

B11. Should tickets be given to bicyclists?

	Number	Percentage
Yes	35	67%
No	12	23%
No response	5	10%
Total	**52**	**100%**

B12. How often do you stop at stop signs?

	Number	Percentage
Never	1	2%
Sometimes	15	29%
Often	17	33%
All the time	15	29%
No response	4	8%
Total	**52**	**100%**

B13. Are following statements true or false:

Bicyclists must obey rules of road?

	Number	Percentage
True	45	87%
False	6	12%
No response	1	2%
Total	**52**	**100%**

Roads are open to bikes unless prohibited?

	Number	Percentage
True	42	81%
False	8	15%
No response	2	4%
Total	**52**	**100%**

Other responses -

Better training for drivers
Cleaner streets
Elevated crosswalks
Fewer cars
More bikes on the road
More recognition by motorists that bikes can use the stre
No illegally parked vehicles in bike lanes

MTC Bicycle/Pedestrian Data Collection Project

Origin/Destination of Trips - From Survey (questions #7 and #8)

	Destination County										
Origin County	**Alameda**	**Contra Costa**	**Marin**	**Napa**	**San Francisco**	**San Mateo**	**Santa Clara**	**Solano**	**Sonoma**	**No Response**	**TOTAL**
Alameda	18	1			6		3			1	**29**
Contra Costa	3	9			5						**17**
Marin			3		4						**7**
Napa				4							**4**
San Francisco		1	1		12	1		1		5	**21**
San Mateo					4	6	1			3	**14**
Santa Clara							6				**6**
Solano								1		2	**3**
Sonoma					1				4		**5**
No Response						2				22	**24**
TOTAL	**21**	**11**	**4**	**4**	**32**	**9**	**10**	**2**	**4**	**33**	**130**

	Destination County										
Origin County	**Alameda**	**Contra Costa**	**Marin**	**Napa**	**San Francisco**	**San Mateo**	**Santa Clara**	**Solano**	**Sonoma**	**No Reponse**	**TOTAL**
Alameda	14%	1%			5%		2%			1%	**22%**
Contra Costa	2%	7%			4%						**13%**
Marin			2%		3%						**5%**
Napa				3%							**3%**
San Francisco		1%	1%		9%	1%		1%		4%	**16%**
San Mateo					3%	5%	1%			2%	**11%**
Santa Clara							5%				**5%**
Solano								1%		2%	**2%**
Sonoma					1%				3%		**4%**
No Response						2%				17%	**18%**
TOTAL	**16%**	**8%**	**3%**	**3%**	**25%**	**7%**	**8%**	**2%**	**3%**	**25%**	**100%**

Intra-county trips = 48%

Inter-county trips = 52%

ABOUT YOU....

1. Gender ___ Male ___ Female

2. Age ___ Under 16 ___ 16 - 39 ___ 40 - 64 ___ 65+

3. Household Income
___ Under $25,000 ___ $25,000 - $49,999 ___ $50,000-74,999 ___ $75,000+

4. Do you own a car? ___ Yes ___ No

ABOUT YOUR TRIP TODAY....

5. What is the primary purpose of your trip today? Check one.
___ Work Commute ___ School Commute ___ Other _____
___ Recreation/Exercise ___ Shopping/Errands/Food

6. Which other modes of transportation will you use on your trip today? Check all that apply.
___ Walk ___ Motorcycle ___ Bus ___ Other Rail
___ Bicycle ___ Auto ___ BART ___ Ferry

7. Where did you start your trip today?
___ Home ___ Work ___ School ___ Other: _____
What city? Nearest Intersection:
_____ _____

8. Where did you end your trip today?
___ Home ___ Work ___ School ___ Other: _____
What city? Nearest Intersection:
_____ _____

ABOUT YOUR ACCIDENT EXPERIENCE....

9. Have you ever been involved in a crash or accident with a vehicle while walking or bicycling?
___ Yes ___ No

10. If yes, what was the extent of the injury?
___ None/Property Damage Only ___ Minor Physical Injury ___ Serious Physical Injury

11. If yes, was the accident reported to the police?
___ Reported ___ Not Reported

COMMENTS....

_____
_____
_____

(continue survey on the inside...)

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Metropolitan Transportation Commission
Attn: Trent Lethco
Joseph P. Bort MetroCenter
101 Eighth St.
Oakland, CA 94607-9965

BAY AREA PEDESTRIAN & BICYCLIST SURVEY

Thank you for taking a survey form for pedestrians and bicyclists. We hope you will complete and return the form — it should take only a few minutes to complete. Once you've completed the survey, you can leave it with the person who gave it to you or drop it in the mail. Please be sure the survey is sealed and mailed back by **October 9, 2002.**

For more information on this project, please contact: Trent Lethco at (510) 464-7737 — tlethco@mtc.ca.gov or Nancy Okasaki at (510) 464-7759 — nokasaki@mtc.ca.gov

TO MAIL PLEASE SEAL WITH TAPE.

Purpose of the Pedestrian and Bicyclist Survey

The Metropolitan Transportation Commission (MTC) is the transportation planning, funding and coordinating agency for the nine-county San Francisco Bay Area. MTC is interested in learning more about how people travel on foot and by bicycle. Your responses to our survey will provide important information that MTC will use in planning for pedestrian and bicyclist needs in our region.

METROPOLITAN TRANSPORTATION COMMISSION
101 Eighth Street Oakland, CA 94607 (510) 464-7700

IF YOU ARE WALKING TODAY...

The following questions refer to walking or jogging on public streets, including sidewalks and shoulders

W1. Roughly how many times per week do you walk for...

Less than 10 minutes?	1 - 2	3 - 4	5+
10 - 30 minutes?	1 - 2	3 - 4	5+
Over 30 minutes?	1 - 2	3 - 4	5+

W2. On a scale of 1 to 10, how safe do you feel when crossing the street?
(1 = not safe at all and 10 = very safe) Circle one.

1 2 3 4 5 6 7 8 9 10

W3. At a traffic light, what is the meaning of a flashing red hand symbol? ***Check one.***

___ Don't start to cross the street.
___ Hurry up! The light is about to turn red.
___ Not sure

W4. When is it ok to cross the street mid-block*?
Check one.

___ Never
___ Only when there is a marked crosswalk
___ When there is no marked crosswalk, but you've looked to make sure there is no oncoming traffic
___ Pedestrians can cross wherever they want
___ No response

**Mid-block refers to locations on a street which are in between intersections.*

W5. Should the police issue tickets to pedestrians for unlawful behavior?

___ Yes ___ No

W6. When is it ok to cross against a red light?
Check one.

___ Never
___ When there is no oncoming traffic
___ When there is no oncoming traffic and you know the light is about to turn green
___ When other people are doing it
___ No response

W7. Do you jaywalk? ***Check one.***

___ Never ___ Often ___ No response
___ Sometimes ___ All the time

W8. Which of following statements best describes your behavior when you cross the street at a traffic light? ***Check one.***

___ I generally don't pay attention to the Walk/Don't Walk signal and just cross whenever I think it's safe.
___ I wait for the Walk signal before I start crossing and continue to remain watchful of oncoming vehicles for as long as I'm in the crosswalk.
___ I wait for the Walk signal before I start crossing but sometimes fail to watch for oncoming vehicles.

W9. At intersections with pedestrian signals, do you feel that pedestrians are generally given enough time to cross the street?

___ Yes ___ No

IF YOU ARE BICYCLING TODAY...

B1. Why did you bicycle on this trip?
Check all that apply.

___ No car available
___ Saves time
___ Parking not available at the start or end this trip
___ Parking is too expensive
___ Exercise/recreation
___ More convenient
___ Protect the environment
___ For my health

B2. How often do you use your bicycle?
Check one.

___ 2 or more times per day
___ Several times a week
___ Several times a month
___ Several times a year

B3. Roughly how far did you ride your bicycle on this trip?
Check one for either distance or time.

___ 0 - 2 miles ___ less than 10 minutes
___ 3 - 5 miles ___ 10 - 20 minutes
___ 6 - 8 miles ___ 21 - 30 minutes
___ Over 9 miles ___ Over 30 minutes

B4. How often do you use public transit? ***Check one.***

___ Never ___ A few times a week
___ A few times a month ___ Every day

B5. Do you take your bicycle on public transit?
Check one.

___ Never
___ Yes, a few times a month
___ Yes, a few times a week
___ Yes, every day

B6. I prefer to ride my bike:
(Rank in order of preference 1 = most preferred, 4 = least preferred)

___ On any city street
___ On streets with signs identifying a bike route
___ On streets with a painted bike lane
___ Off street on bicycle trails

B7. If you did not have a bicycle, would you or someone in your household own an additional car?

___ Yes ___ No

B8. Do you generally wear a helmet when you bicycle?

___ Yes ___ No

B9. On a scale of 1 to 10, how safe do you feel when biking?
(1 = not safe at all and 10 = very safe) Circle one.

1 2 3 4 5 6 7 8 9 10

B10. What would make you feel safer when bicycling?
(Rank the following, with 1 being the safest 4 being least safe)

___ A bicycle lane on the street
___ More bicycle trails or paths
___ Motorists following the rules of the road
___ Slower-moving cars
___ Other: _____

B11. Should the police issue tickets to bicyclists for unlawful behavior?

___ Yes ___ No

B12. How often do you stop at stop signs? ***Check one.***

___ Never ___ Often ___ No response
___ Sometimes ___ All the time

B13. Are the following statements true or false?

A bicyclist must obey all traffic laws that apply to motor vehicles. ___ True ___ False

In California, all roadways are open to bicyclists unless otherwise expressly prohibited. ___ True ___ False

APPENDIX F

TECHNICAL MEMORANDUM 5 – ANALYSIS OF BICYCLE COLLISION RATES

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

MEMO

SAN FRANCISCO OFFICE
January 3, 2003 Project Number: 378980

To: Trent Lethco, MTC Project Manager

From: Tim Erney / Carol Levine

Subject: MTC Bicycle and Pedestrian Data Collection Project
Technical Memorandum 5 – Analysis of Bicycle Collision Rates

This memorandum presents the results of the bicycle collision analysis component of the MTC Bicycle and Pedestrian Data Collection project. Included are a description of the data sources, the methodology/approach and a brief summary of the results. The complete results, summarized by location and county, are attached. In addition, recommendations for future analysis efforts are included.

The purpose of this effort was to estimate the current bicycle collision rates, in terms of collisions per million trips, at the locations where bicycle counts were conducted in the data collection phase of this project. Comparisons were then conducted to determine potential relationships between the collision rates and the estimated daily bicycle volumes, location of the counts and the area type.

Bicycle Volumes
As part of the data collection effort for this project, bicyclist counts were conducted at 98 locations throughout the nine-county Bay Area (see Technical Memorandum #3). At each location, counts were conducted between 7:00 and 9:00 AM and between 4:00 and 6:00 PM on Tuesdays, Wednesdays and Thursdays throughout September and October of 2002.

To convert the peak period volumes into daily volumes, the total AM and PM peak period counts were multiplied by a factor of 2.5 (i.e., the four peak hours represent 40 percent of the daily volume). This factor was based on a comparison of peak period volumes to daily volumes from recent 24-hour vehicle counts taken throughout the Bay Area. The peak period and estimated daily bicycle volumes are presented in Table 1.

In general, the highest bicycle volume locations were within San Francisco, near downtown in other cities (including Berkeley and Mountain View), and along bicycle trails and paths, such as the Ohlone Trail in El Cerrito and the Mill Valley Path in Mill Valley. However, other bicycle trails and paths, including the Iron Horse Trail and the Delta De Anza Trail, had relatively low

bicycle volumes. It should be noted that since the bicyclist counts were conducted during the morning and evening commute periods on weekdays, count locations that primarily serve recreational users have low counts and corresponding low estimated daily volumes (since recreational users tend to travel during the weekday midday and weekends). As such, the estimated daily counts at these locations may not accurately reflect the actual bicycle activity levels.

Collision Information

At each of the count locations, the number of bicycle-related collisions were obtained from the MTC 2001 Regional Bike Plan map (in GIS). This information was based on the California Highway Patrol's *Statewide Integrated Traffic Records System* (*SWITRS*) database for years 1991-2000.[1] Since the data was for a 10-year period, the number of collision at each location was divided by a factor of 10 to estimate the average number of collisions per year. Table 1 presents the 10-year and the average annual collisions at the count locations. It should be noted that the *SWITRS* database only provides information at intersections; therefore, collision data could not be obtained for the count locations along paths and trails (such as the Downtown Waterfront Path in Rio Vista).

In general, the locations with the highest number of bicycle-related collisions were found in San Francisco (25 collisions over the 10-year period) and suburban locations such as Mountain View (20), Sausalito (20), Berkeley (19) and Santa Rosa (17).

It should be noted that collision information was one of the criteria used in the selection of bicyclist count locations for this project (see Technical Memorandum #1), and several locations were selected because they had a high number of collisions. As such, these count locations may not represent typical intersections within the individual jurisdictions or counties.

Collision Rates

In order to compare the collision rates at different locations, the number of bicycle collisions per million bicycle trips was determined for each location. To estimate the annual bicycle volumes, the daily volumes were multiplied by a factor of 365.[2] The bicycle collision rates are also presented in Table 1. Overall, the rates varied from 0.0 to 73.1 bicycle collisions per million bicycle trips.

Analysis

Three comparisons were conducted to determine potential relationships with the collision rates, including relationships with the estimated daily bicycle volumes, county of the count location, and the area type of the count location.

[1] The *SWITRS* data including only reported accidents that involved property damage or injury. Note that it is required that accidents involving injury and/or property damage over $500 be reported. In addition, the *SWITRS* data does not include accidents on private property.

[2] This factor is consistent with the analysis used in the *Alameda Countywide Bicycle Plan – Final Report*, July 2001.

Daily volumes: The collision rates were sorted and averaged by estimated daily bicycle volumes, as shown in Table 2. Overall, it was found that the collision rates were generally highest for the low volume locations (i.e., daily volumes of less than 100 bicyclists) and lowest for the high volume locations (i.e., daily volumes of greater than 500 bicyclists). In other words, although the count locations in San Francisco tended to have the highest number of collisions, the actually collision rates were relatively low due to the high annual bicycle volumes.

The relationship between annual bicycle volumes and collision rates likely results from two factors. First, at low bicycle volume locations, bicyclists are fairly infrequent and drivers, pedestrians and other bicyclists may not be expecting bicycle activity. Conversely, at high bicycle volume locations, drivers, pedestrians and bicyclists are more familiar with bicycle activity. Second, locations with high levels of bicycle activity may have better bicycle facilities, including wide curb lanes and on-street bicycle lanes, which result in additional safety for bicyclists.

It should be noted that at the low bicycle volume locations, a small number of collisions would result in a high collision rate. For example, at the Military West and Second Street location in Benicia, there were only two collisions between 1991 and 2000. However, this location had very low bicycle volumes (estimated to be less than 10 bicyclists per day), and thus had a high collision rate (73.1 collisions per million bicycle trips). In addition, it should be noted that the estimated annual volumes may be somewhat low for locations which primarily serve recreational users (as discussed previously), which would result in somewhat high collision rates. Therefore, it is possible that the high collision rates at the low volume locations may not accurately reflect the conditions at these locations.

County: The collision rates at each location were averaged by county, as shown in Table 3. The average rate per county varied between 4.7 bicycle collisions per million bicycle trips in San Francisco County to 14.8 bicycle collisions per million bicycle trips in Solano County. Although the lowest average rate was in an urban county with high levels of activity and the highest average rate was in a suburban/rural county with low levels of activity, there seemed to be no direct correlation between county characteristics and collision rates.

Area type: The area type (urban, suburban or rural) of the count locations was estimated, primarily based on the jurisdiction and county of each location. In general, the count locations within the cities of San Francisco, Berkeley, Oakland and San Jose were classified as "urban" and the remainder were classified as "suburban", except specific locations within Alameda, Napa and Solano Counties. Table 4 presents the classifications and the average rate for each area type. In general, the "urban" locations had the lowest collision rates and the "rural" locations had the highest collision rates. It should be noted that the "urban" locations tended to have the highest annual bicycle volumes, whereas the "rural" locations tended to have the lowest annual bicycle volumes. As such, several of the relationships discussed above would also be applicable for this analysis. In addition, vehicles tend drive slower within urban environments (due to general traffic congestion) and faster in rural environments, which also may affect the collision rates.

Conclusions

Overall, locations in urban environments with high volumes of bicycle traffic tended to have the lowest collision rates, whereas rural and low volume locations tended to have the highest collision rates. This relationship is likely due to familiarity with bicycle activity at these locations (i.e., drivers, pedestrians and bicyclist are used to each other), the provision of bicycle facilities, and the average speed of traffic. In addition, the low volume locations may have had somewhat high collision rates due to the sensitivity of the collision rates and more recreational users that are not reflected in the counts.

Limitations of Analysis/Recommendations

It should be noted that the results of this analysis are somewhat limited. The following sections present the limitations to the results, and recommendations to improve the analysis for future efforts.

- The bicycle counts reflect average weekday conditions, and therefore do not account for weekend and recreational users. In addition, the counts were conducted in good weather during the school year, and therefore do not account for summer activity and bad weather conditions. As such, the factor used to convert the daily bicycle volume to an annual volume (365 days, as used in the *Alameda Countywide Bicycle Plan – Final Report*) may need to be further examined and potentially revised.
- At the time of the analysis, only *SWITRS* data from 1991 to 2000 was available. From this information, the average number of collisions per year were estimated. Although it is appropriate to use an average value, the data range should be narrowed to three years or five years, since there may be substantial changes to the bicycle network and bicycle volumes within the 10-year period.
- Since the bicycle counts are current, there will be a temporal discrepancy between the counts and the available collision information. Typically, *SWITRS* data is one or two years old. As such, the most recent *SWITRS* information should be used to ensure consistency between the data sources.
- The collision data used in this analysis did not distinguish between the types of bicyclist collisions or the bicycle facilities at the intersection. For future analysis, the *SWITRS* data could be disaggregated by collision type (i.e., vehicle-bicycle, bicycle-bicycle, pedestrian-bicycle) and facility type (i.e., bicycle lane, wide curb lane), and additional comparisons could be conducted.
- If collision rates are to be conducted at the same intersections in the future, any major differences to the vehicular and bicycle network, and any major changes to the nearby land uses should be noted. These changes may affect the results of the collision rate analysis and may lead to inaccurate comparisons.

If collision data on pedestrians at intersections becomes available, a similar pedestrian collision rate analysis should be performed. The conversion factors from peak period to daily volumes and from daily to annual volumes would likely be similar to those developed for the bicycle analysis. The pedestrian analysis should include the same comparisons between collision rates

and the estimated daily pedestrian volumes, county of the count location, and the area type of the count location. In addition, any order-of-magnitude differences between the bicyclist and pedestrians rates should be assessed.

MTC Bicycle/Pedestrian Data Collection Project

Table 1 - Estimation of Daily Volumes and Collision Rates

County	Jurisdiction	Intersection	Area-Type	AM Counts	PM Counts	~ Daily Volume	10-Year Collisions	Avg Collisions per Year	Collisions per Million Trips
Alameda	Alameda	Otis @ Park	Suburban	20	58	195	16	1.60	22.5
Alameda	Berkeley	Hearst @ Oxford	Urban	111	124	588	19	1.90	8.9
Alameda	Berkeley	Virginia @ San Pablo	Urban	59	69	320	8	0.80	6.8
Alameda	Dublin	Iron Horse @ Dublin Blvd	Suburban	11	17	70	0	0.00	0.0
Alameda	Emeryville	Powell St @ Christie	Suburban	9	7	40	3	0.30	20.5
Alameda	Fremont	Fremont Blvd @ Mowry	Suburban	50	90	350	16	1.60	12.5
Alameda	Hayward	Winton @ Amador	Suburban	20	18	95	9	0.90	26.0
Alameda	Livermore	Wente St/Concannon @ Livermore Ave	Rural	1	16	43	2	0.20	12.9
Alameda	Oakland	Grand Av @ Staten Av	Urban	52	48	250	6	0.60	6.6
Alameda	Oakland	66th @ San Leandro	Urban	67	63	325	4	0.40	3.4
Alameda	Pleasanton	Bernal @ Main	Suburban	26	11	93	3	0.30	8.9
Alameda	San Leandro	Bancroft @ Estudillio	Suburban	20	20	100	3	0.30	8.2
Alameda	Union City	Alvarado-Niles @ Decoto	Suburban	35	37	180	16	1.60	24.4
Contra Costa	Antioch	L St. @ 18th St	Suburban	24	17	103	1	0.10	2.7
Contra Costa	Brentwood	Brentwood Blvd @ Oak	Suburban	5	9	35	0	0.00	0.0
Contra Costa	Concord	Grant @ Concord Blvd	Suburban	20	28	120	0	0.00	0.0
Contra Costa	County/P.H.	Coggins and Jones @ Treat	Suburban	51	53	260	5	0.50	5.3
Contra Costa	Danville	Railroad Ave @ Hartz/Danville Blvd	Suburban	5	8	33	5	0.50	42.1
Contra Costa	El Cerrito	Ohlone Trail @ Fairmount Ave	Suburban	103	99	505	0	0.00	0.0
Contra Costa	Lafayette	Mt. Diablo @ Moraga Rd	Suburban	15	38	133	0	0.00	0.0
Contra Costa	Martinez	Muir Rd @ Pacheco Blvd	Suburban	3	3	15	0	0.00	0.0
Contra Costa	Orinda	Moraga Wy @ Ivy Dr	Suburban	3	8	28	0	0.00	0.0
Contra Costa	Pittsburg	Delta De Anza Trail @ Los Medanos	Suburban	5	8	33	0	0.00	0.0
Contra Costa	Richmond	MacDonald @ Marina	Suburban	8	65	183	4	0.40	6.0
Contra Costa	San Ramon	Executive Prkwy @ Camino Ramon	Suburban	5	3	20	0	0.00	0.0
Contra Costa	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	Suburban	29	22	128	9	0.90	19.3
Marin	Corte Madera	Camino Alto @ Madera/Chapman	Suburban	51	32	208	1	0.10	1.3
Marin	Fairfax	Pacheco @ Center/Broadway	Suburban	57	110	418	10	1.00	6.6
Marin	Larkspur	E. S.F. Drake @ Larkspur Landing	Suburban	54	26	200	3	0.30	4.1
Marin	Novato	Grant @ 7th St	Suburban	13	14	68	12	1.20	48.7
Marin	Novato	Alameda del Prado/Nave Dr	Suburban	9	22	78	0	0.00	0.0
Marin	San Rafael	4th St @ Lincoln Ave	Suburban	41	35	190	15	1.50	21.6
Marin	San Rafael	B St @ 2nd St	Suburban	21	23	110	0	0.00	0.0
Marin	Sausalito	Bridgeway @ Princess	Suburban	61	89	375	20	2.00	14.6
Marin	Mill Valley	Mill Valley Path @ E. Blithdale	Suburban	96	74	425	0	0.00	0.0
Marin	Tiburon	Main St @ Tiburon Blvd	Suburban	41	21	155	0	0.00	0.0
Marin	Mill Valley	101 @ Seminary	Suburban	19	7	65	0	0.00	0.0
Napa	American Canyon	SR 29 @ American Canyon	Suburban	2	6	20	0	0.00	0.0
Napa	Calistoga	Lincoln St (SR 29) @ Washington St	Suburban	9	38	118	0	0.00	0.0
Napa	County	Dry Creek @ Orchard	Rural	6	25	78	0	0.00	0.0
Napa	County	Old Sonoma Rd @ 121	Rural	0	0	0	1	0.10	0.0
Napa	Napa	Lincoln Ave @ Jefferson St	Suburban	27	39	165	11	1.10	18.3
Napa	Napa	1st @ School Rd	Suburban	10	41	128	2	0.20	4.3
Napa	Oakville	Siverado Trail @ Oakville Cross	Rural	1	2	8	1	0.10	36.5
Napa	St Helena	Main (SR 29) @ Adams (St. Helena Hwy)	Suburban	5	25	75	4	0.40	14.6
Napa	Yountville	Finnell @ Yountville Cross	Rural	9	29	95	1	0.10	2.9

MTC Bicycle/Pedestrian Data Collection Project

Table 1 - Estimation of Daily Volumes and Collision Rates

County	Jurisdiction	Intersection	Area-Type	AM Counts	PM Counts	~ Daily Volume	10-Year Collisions	Avg Collisions per Year	Collisions per Million Trips
San Francisco	San Francisco	3rd St @ Howard	Urban	-	-	-	-	-	-
San Francisco	San Francisco	Embarcadero @ Washington	Urban	115	181	740	3	0.30	1.1
San Francisco	San Francisco	Seventh @ Folsom	Urban	207	151	895	5	0.50	1.5
San Francisco	San Francisco	Geary @ Divasadero	Urban	-	-	-	-	-	-
San Francisco	San Francisco	GG Park Panhandle @ Baker St	Urban	114	147	653	1	0.10	0.4
San Francisco	San Francisco	Haight @ Scott	Urban	183	286	1,173	25	2.50	5.8
San Francisco	San Francisco	Van Ness @ Turk	Urban	43	75	295	16	1.60	14.9
San Francisco	San Francisco	Ocean @ Geneva	Urban	-	-	-	-	-	-
San Francisco	San Francisco	3rd St @ 16th St	Urban	27	46	183	3	0.30	4.5
San Mateo	Belmont	Ralston @ 6th	Suburban	12	5	43	6	0.60	38.7
San Mateo	Burlingame	California Dr @ Lincoln Ave	Suburban	11	8	48	10	1.00	57.7
San Mateo	Daly City	John Daly Blvd @ Lake Merced Blvd	Suburban	14	13	68	0	0.00	0.0
San Mateo	Daly City	Mission @ E. Market	Suburban	3	12	38	0	0.00	0.0
San Mateo	East Palo Alto	University @ Bay Road	Suburban	24	43	168	5	0.50	8.2
San Mateo	Foster City	Hillsdale Blvd @ Edgewater Blvd	Suburban	29	29	145	8	0.80	15.1
San Mateo	Half Moon Bay	Main @ Correas	Suburban	11	23	85	0	0.00	0.0
San Mateo	Millbrae	Millbrae @ Magnolia	Suburban	7	5	30	0	0.00	0.0
San Mateo	Pacifica	Francisco @ Paloma	Suburban	15	2	43	0	0.00	0.0
San Mateo	Redwood City	Main @ Middlefield	Suburban	45	46	228	3	0.30	3.6
San Mateo	Redwood Shores	Redwood Shores @ Twin Dolphin	Suburban	17	10	68	1	0.10	4.1
San Mateo	San Bruno	El Camino @ Sneath	Suburban	13	19	80	0	0.00	0.0
San Mateo	San Mateo	Delaware St @ 3rd Ave	Suburban	53	49	255	11	1.10	11.8
San Mateo	South SF	Grand @ Airport Blvd	Suburban	28	27	138	1	0.10	2.0
Santa Clara	Campbell	Bascom @ Hamilton	Suburban	64	59	308	11	1.10	9.8
Santa Clara	Cupertino	Stevens Creek @ De Anza	Suburban	23	41	160	3	0.30	5.1
Santa Clara	Gilroy	Monterey @ 7th St	Suburban	39	30	173	2	0.20	3.2
Santa Clara	Milpitas	Dixon Landing @ Milpitas	Suburban	8	9	43	6	0.60	38.7
Santa Clara	Morgan Hill	Monterey @ Main (El Camino Real)	Suburban	18	17	88	1	0.10	3.1
Santa Clara	Mountain View	California St @ Escuela Av	Suburban	104	92	490	20	2.00	11.2
Santa Clara	Palo Alto	Foothill @ Page Mill	Suburban	63	82	363	1	0.10	0.8
Santa Clara	Palo Alto	University @ Emerson	Suburban	80	42	305	0	0.00	0.0
Santa Clara	San Jose	San Fernando @ 7th	Urban	20	39	148	0	0.00	0.0
Santa Clara	San Jose	Santa Clara @ Montgomery	Urban	18	32	125	1	0.10	2.2
Santa Clara	Santa Clara	El Camino Real @ Railroad	Suburban	20	23	108	0	0.00	0.0
Santa Clara	Santa Clara	Homestead Rd @ Kiely Blvd	Suburban	23	27	125	14	1.40	30.7
Solano	Benicia	Military West @ 2nd St	Rural	3	0	8	2	0.20	73.1
Solano	County	Dixon-Davis Bike Route @ Vaughn	Rural	0	0	0	0	0.00	0.0
Solano	Dixon	First Street @ C St	Suburban	8	10	45	1	0.10	6.1
Solano	Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	Rural	0	0	0	1	0.10	0.0
Solano	Fairfield	Travis @ Texas	Suburban	17	33	125	12	1.20	26.3
Solano	Rio Vista	Downtown Waterfront Path	Rural	0	2	5	NR	-	-
Solano	Suisun City	Main @ Lotz	Suburban	3	1	10	0	0.00	0.0
Solano	Vacaville	Alamo @ Nut Tree	Suburban	48	38	215	10	1.00	12.7
Solano	Vacaville	Downtown Creekwalk	Suburban	37	47	210	NR	-	-
Solano	Vallejo	Solano Bikeway @ Columbus Prkwy	Suburban	0	4	10	0	0.00	0.0
Solano	Vallejo	Waterfront Path	Suburban	0	0	0	NR	-	-

MTC Bicycle/Pedestrian Data Collection Project

Table 1 - Estimation of Daily Volumes and Collision Rates

County	Jurisdiction	Intersection	Area-Type	AM Counts	PM Counts	~ Daily Volume	10-Year Collisions	Avg Collisions per Year	Collisions per Million Trips
Sonoma	Cotati	Old Redwood Hwy @ Cotati Ave	Suburban	16	29	113	0	0.00	0.0
Sonoma	Healdsburg	Healdsburg Ave @ Matheson St	Suburban	16	32	120	1	0.10	2.3
Sonoma	Petaluma	A St @ Howard St and 6th St	Suburban	3	13	40	12	1.20	82.2
Sonoma	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	Suburban	4	13	43	0	0.00	0.0
Sonoma	Santa Rosa	2nd St @ Santa Rosa Ave	Suburban	12	34	115	1	0.10	2.4
Sonoma	Santa Rosa	Mendocino Ave @ Pacific Ave	Suburban	66	64	325	17	1.70	14.3
Sonoma	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	Suburban	14	20	85	0	0.00	0.0
Sonoma	Sonoma	Hwy 12-Sonoma Hwy @ Veranc	Suburban	32	38	175	0	0.00	0.0
Sonoma	Sonoma	Broadway @ W. Napa St (12)	Suburban	17	41	145	0	0.00	0.0

Notes:

~ Daily Volume estimated as 2.5 times AM and PM counts

10-Year Collision information from SWITRS 1991-2000

NR = No Record

MTC Bicycle/Pedestrian Data Collection Project

Table 2 - Collision Rates by Daily Volume

County	Jurisdiction	Intersection	~ Daily Volumes	Collisions per Million Trips
Napa	County	Old Sonoma Rd @ 121	0	0.0
Solano	County	Dixon-Davis Bike Route @ Vaughn	0	0.0
Solano	Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	0	0.0
Solano	Vallejo	Waterfront Path	0	-
Solano	Rio Vista	Downtown Waterfront Path	5	-
Napa	Oakville	Siverado Trail @ Oakville Cross	8	36.5
Solano	Benicia	Military West @ 2nd St	8	73.1
Solano	Suisun City	Main @ Lotz	10	0.0
Solano	Vallejo	Solano Bikeway @ Columbus Prkwy	10	0.0
Contra Costa	Martinez	Muir Rd @ Pacheco Blvd	15	0.0
Contra Costa	San Ramon	Executive Prkwy @ Camino Ramon	20	0.0
Napa	American Canyon	SR 29 @ American Canyon	20	0.0
Contra Costa	Orinda	Moraga Wy @ Ivy Dr	28	0.0
San Mateo	Millbrae	Millbrae @ Magnolia	30	0.0
Contra Costa	Pittsburg	Delta De Anza Trail @ Los Medanos	33	0.0
Contra Costa	Danville	Railroad Ave @ Hartz/Danville Blvd	33	42.1
Contra Costa	Brentwood	Brentwood Blvd @ Oak	35	0.0
San Mateo	Daly City	Mission @ E. Market	38	0.0
Alameda	Emeryville	Powell St @ Christie	40	20.5
Sonoma	Petaluma	A St @ Howard St and 6th St	40	82.2
San Mateo	Pacifica	Francisco @ Paloma	43	0.0
Sonoma	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	43	0.0
Alameda	Livermore	Wente St/Concannon @ Livermore Ave	43	12.9
San Mateo	Belmont	Ralston @ 6th	43	38.7
Santa Clara	Milpitas	Dixon Landing @ Milpitas	43	38.7
Solano	Dixon	First Street @ C St	45	6.1
San Mateo	Burlingame	California Dr @ Lincoln Ave	48	57.7
Marin	Mill Valley	101 @ Seminary	65	0.0
San Mateo	Daly City	John Daly Blvd @ Lake Merced Blvd	68	0.0
San Mateo	Redwood Shores	Redwood Shores @ Twin Dolphin	68	4.1
Marin	Novato	Grant @ 7th St	68	48.7
Alameda	Dublin	Iron Horse @ Dublin Blvd	70	0.0
Napa	St Helena	Main (SR 29) @ Adams (St. Helena Hwy)	75	14.6
Marin	Novato	Alameda del Prado/Nave Dr	78	0.0
Napa	County	Dry Creek @ Orchard	78	0.0
San Mateo	San Bruno	El Camino @ Sneath	80	0.0
San Mateo	Half Moon Bay	Main @ Correas	85	0.0
Sonoma	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	85	0.0
Santa Clara	Morgan Hill	Monterey @ Main (El Camino Real)	88	3.1
Alameda	Pleasanton	Bernal @ Main	93	8.9
Napa	Yountville	Finnell @ Yountville Cross	95	2.9
Alameda	Hayward	Winton @ Amador	95	26.0
		AVERAGE		**12.9**

MTC Bicycle/Pedestrian Data Collection Project

Table 2 - Collision Rates by Daily Volume

County	Jurisdiction	Intersection	~ Daily Volumes	Collisions per Million Trips
Alameda	San Leandro	Bancroft @ Estudillio	100	8.2
Contra Costa	Antioch	L St. @ 18th St	103	2.7
Santa Clara	Santa Clara	El Camino Real @ Railroad	108	0.0
Marin	San Rafael	B St @ 2nd St	110	0.0
Sonoma	Cotati	Old Redwood Hwy @ Cotati Ave	113	0.0
Sonoma	Santa Rosa	2nd St @ Santa Rosa Ave	115	2.4
Napa	Calistoga	Lincoln St (SR 29) @ Washington St	118	0.0
Contra Costa	Concord	Grant @ Concord Blvd	120	0.0
Sonoma	Healdsburg	Healdsburg Ave @ Matheson St	120	2.3
Santa Clara	San Jose	Santa Clara @ Montgomery	125	2.2
Solano	Fairfield	Travis @ Texas	125	26.3
Santa Clara	Santa Clara	Homestead Rd @ Kiely Blvd	125	30.7
Napa	Napa	1st @ School Rd	128	4.3
Contra Costa	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	128	19.3
Contra Costa	Lafayette	Mt. Diablo @ Moraga Rd	133	0.0
San Mateo	South SF	Grand @ Airport Blvd	138	2.0
Sonoma	Sonoma	Broadway @ W. Napa St (12)	145	0.0
San Mateo	Foster City	Hillsdale Blvd @ Edgewater Blvd	145	15.1
Santa Clara	San Jose	San Fernando @ 7th	148	0.0
Marin	Tiburon	Main St @ Tiburon Blvd	155	0.0
Santa Clara	Cupertino	Stevens Creek @ De Anza	160	5.1
Napa	Napa	Lincoln Ave @ Jefferson St	165	18.3
San Mateo	East Palo Alto	University @ Bay Road	168	8.2
Santa Clara	Gilroy	Monterey @ 7th St	173	3.2
Sonoma	Sonoma	Hwy 12-Sonoma Hwy @ Verano	175	0.0
Alameda	Union City	Alvarado-Niles @ Decoto	180	24.4
San Francisco	San Francisco	3rd St @ 16th St	183	4.5
Contra Costa	Richmond	MacDonald @ Marina	183	6.0
Marin	San Rafael	4th St @ Lincoln Ave	190	21.6
Alameda	Alameda	Otis @ Park	195	22.5
		AVERAGE		**7.6**
Marin	Larkspur	E. S.F. Drake @ Larkspur Landing	200	4.1
Marin	Corte Madera	Camino Alto @ Madera/Chapman	208	1.3
Solano	Vacaville	Downtown Creekwalk	210	-
Solano	Vacaville	Alamo @ Nut Tree	215	12.7
San Mateo	Redwood City	Main @ Middlefield	228	3.6
Alameda	Oakland	Grand Av @ Staten Av	250	6.6
San Mateo	San Mateo	Delaware St @ 3rd Ave	255	11.8
Contra Costa	County/P.H.	Coggins and Jones @ Treat	260	5.3
San Francisco	San Francisco	Van Ness @ Turk	295	14.9
Santa Clara	Palo Alto	University @ Emerson	305	0.0
Santa Clara	Campbell	Bascom @ Hamilton	308	9.8
Alameda	Berkeley	Virginia @ San Pablo	320	6.8
Alameda	Oakland	66th @ San Leandro	325	3.4
Sonoma	Santa Rosa	Mendocino Ave @ Pacific Ave	325	14.3
Alameda	Fremont	Fremont Blvd @ Mowry	350	12.5
Santa Clara	Palo Alto	Foothill @ Page Mill	363	0.8
Marin	Sausalito	Bridgeway @ Princess	375	14.6
Marin	Fairfax	Pacheco @ Center/Broadway	418	6.6
Marin	Mill Valley	Mill Valley Path @ E. Blithdale	425	0.0
Santa Clara	Mountain View	California St @ Escuela Av	490	11.2
		AVERAGE		**7.4**

MTC Bicycle/Pedestrian Data Collection Project

Table 2 - Collision Rates by Daily Volume

County	Jurisdiction	Intersection	~ Daily Volumes	Collisions per Million Trips
Contra Costa	El Cerrito	Ohlone Trail @ Fairmount Ave	505	0.0
Alameda	Berkeley	Hearst @ Oxford	588	8.9
San Francisco	San Francisco	GG Park Panhandle @ Baker St	653	0.4
San Francisco	San Francisco	Embarcadero @ Washington	740	1.1
San Francisco	San Francisco	Seventh @ Folsom	895	1.5
San Francisco	San Francisco	Haight @ Scott	1,173	5.8
San Francisco	San Francisco	3rd St @ Howard	-	-
San Francisco	San Francisco	Geary @ Divasadero	-	-
San Francisco	San Francisco	Ocean @ Geneva	-	-
		AVERAGE		**3.0**

MTC Bicycle/Pedestrian Data Collection Project

Table 3 - Collision Rates by County

County	Jurisdiction	Intersection	County	Collisions per Million Trips
Alameda	Dublin	Iron Horse @ Dublin Blvd	Alameda	0.0
Alameda	Oakland	66th @ San Leandro	Alameda	3.4
Alameda	Oakland	Grand Av @ Staten Av	Alameda	6.6
Alameda	Berkeley	Virginia @ San Pablo	Alameda	6.8
Alameda	San Leandro	Bancroft @ Estudillio	Alameda	8.2
Alameda	Berkeley	Hearst @ Oxford	Alameda	8.9
Alameda	Pleasanton	Bernal @ Main	Alameda	8.9
Alameda	Fremont	Fremont Blvd @ Mowry	Alameda	12.5
Alameda	Livermore	Wente St/Concannon @ Livermore Ave	Alameda	12.9
Alameda	Emeryville	Powell St @ Christie	Alameda	20.5
Alameda	Alameda	Otis @ Park	Alameda	22.5
Alameda	Union City	Alvarado-Niles @ Decoto	Alameda	24.4
Alameda	Hayward	Winton @ Amador	Alameda	26.0
		AVERAGE		**12.4**
Contra Costa	Brentwood	Brentwood Blvd @ Oak	Contra Costa	0.0
Contra Costa	Concord	Grant @ Concord Blvd	Contra Costa	0.0
Contra Costa	El Cerrito	Ohlone Trail @ Fairmount Ave	Contra Costa	0.0
Contra Costa	Lafayette	Mt. Diablo @ Moraga Rd	Contra Costa	0.0
Contra Costa	Martinez	Muir Rd @ Pacheco Blvd	Contra Costa	0.0
Contra Costa	Orinda	Moraga Wy @ Ivy Dr	Contra Costa	0.0
Contra Costa	Pittsburg	Delta De Anza Trail @ Los Medanos	Contra Costa	0.0
Contra Costa	San Ramon	Executive Prkwy @ Camino Ramon	Contra Costa	0.0
Contra Costa	Antioch	L St. @ 18th St	Contra Costa	2.7
Contra Costa	County/P.H.	Coggins and Jones @ Treat	Contra Costa	5.3
Contra Costa	Richmond	MacDonald @ Marina	Contra Costa	6.0
Contra Costa	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	Contra Costa	19.3
Contra Costa	Danville	Railroad Ave @ Hartz/Danville Blvd	Contra Costa	42.1
		AVERAGE		**5.8**
Marin	Mill Valley	Mill Valley Path @ E. Blithdale	Marin	0.0
Marin	Mill Valley	101 @ Seminary	Marin	0.0
Marin	Novato	Alameda del Prado/Nave Dr	Marin	0.0
Marin	San Rafael	B St @ 2nd St	Marin	0.0
Marin	Tiburon	Main St @ Tiburon Blvd	Marin	0.0
Marin	Corte Madera	Camino Alto @ Madera/Chapman	Marin	1.3
Marin	Larkspur	E. S.F. Drake @ Larkspur Landing	Marin	4.1
Marin	Fairfax	Pacheco @ Center/Broadway	Marin	6.6
Marin	Sausalito	Bridgeway @ Princess	Marin	14.6
Marin	San Rafael	4th St @ Lincoln Ave	Marin	21.6
Marin	Novato	Grant @ 7th St	Marin	48.7
		AVERAGE		**8.8**
Napa	American Canyon	SR 29 @ American Canyon	Napa	0.0
Napa	Calistoga	Lincoln St (SR 29) @ Washington St	Napa	0.0
Napa	County	Dry Creek @ Orchard	Napa	0.0
Napa	County	Old Sonoma Rd @ 121	Napa	0.0
Napa	Yountville	Finnell @ Yountville Cross	Napa	2.9
Napa	Napa	1st @ School Rd	Napa	4.3
Napa	St Helena	Main (SR 29) @ Adams (St. Helena Hwy)	Napa	14.6
Napa	Napa	Lincoln Ave @ Jefferson St	Napa	18.3
Napa	Oakville	Siverado Trail @ Oakville Cross	Napa	36.5
		AVERAGE		**8.5**

MTC Bicycle/Pedestrian Data Collection Project

Table 3 - Collision Rates by County

County	Jurisdiction	Intersection	County	Collisions per Million Trips
San Francisco	San Francisco	GG Park Panhandle @ Baker St	San Francisco	0.4
San Francisco	San Francisco	Embarcadero @ Washington	San Francisco	1.1
San Francisco	San Francisco	Seventh @ Folsom	San Francisco	1.5
San Francisco	San Francisco	3rd St @ 16th St	San Francisco	4.5
San Francisco	San Francisco	Haight @ Scott	San Francisco	5.8
San Francisco	San Francisco	Van Ness @ Turk	San Francisco	14.9
San Francisco	San Francisco	3rd St @ Howard	San Francisco	-
San Francisco	San Francisco	Geary @ Divasadero	San Francisco	-
San Francisco	San Francisco	Ocean @ Geneva	San Francisco	-
		AVERAGE		**4.7**
San Mateo	Daly City	John Daly Blvd @ Lake Merced Blvd	San Mateo	0.0
San Mateo	Daly City	Mission @ E. Market	San Mateo	0.0
San Mateo	Half Moon Bay	Main @ Correas	San Mateo	0.0
San Mateo	Millbrae	Millbrae @ Magnolia	San Mateo	0.0
San Mateo	Pacifica	Francisco @ Paloma	San Mateo	0.0
San Mateo	San Bruno	El Camino @ Sneath	San Mateo	0.0
San Mateo	South SF	Grand @ Airport Blvd	San Mateo	2.0
San Mateo	Redwood City	Main @ Middlefield	San Mateo	3.6
San Mateo	Redwood Shores	Redwood Shores @ Twin Dolphin	San Mateo	4.1
San Mateo	East Palo Alto	University @ Bay Road	San Mateo	8.2
San Mateo	San Mateo	Delaware St @ 3rd Ave	San Mateo	11.8
San Mateo	Foster City	Hillsdale Blvd @ Edgewater Blvd	San Mateo	15.1
San Mateo	Belmont	Ralston @ 6th	San Mateo	38.7
San Mateo	Burlingame	California Dr @ Lincoln Ave	San Mateo	57.7
		AVERAGE		**10.1**
Santa Clara	Palo Alto	University @ Emerson	Santa Clara	0.0
Santa Clara	San Jose	San Fernando @ 7th	Santa Clara	0.0
Santa Clara	Santa Clara	El Camino Real @ Railroad	Santa Clara	0.0
Santa Clara	Palo Alto	Foothill @ Page Mill	Santa Clara	0.8
Santa Clara	San Jose	Santa Clara @ Montgomery	Santa Clara	2.2
Santa Clara	Morgan Hill	Monterey @ Main (El Camino Real)	Santa Clara	3.1
Santa Clara	Gilroy	Monterey @ 7th St	Santa Clara	3.2
Santa Clara	Cupertino	Stevens Creek @ De Anza	Santa Clara	5.1
Santa Clara	Campbell	Bascom @ Hamilton	Santa Clara	9.8
Santa Clara	Mountain View	California St @ Escuela Av	Santa Clara	11.2
Santa Clara	Santa Clara	Homestead Rd @ Kiely Blvd	Santa Clara	30.7
Santa Clara	Milpitas	Dixon Landing @ Milpitas	Santa Clara	38.7
		AVERAGE		**8.7**
Solano	County	Dixon-Davis Bike Route @ Vaughn	Solano	0.0
Solano	Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	Solano	0.0
Solano	Suisun City	Main @ Lotz	Solano	0.0
Solano	Vallejo	Solano Bikeway @ Columbus Prkwy	Solano	0.0
Solano	Dixon	First Street @ C St	Solano	6.1
Solano	Vacaville	Alamo @ Nut Tree	Solano	12.7
Solano	Fairfield	Travis @ Texas	Solano	26.3
Solano	Benicia	Military West @ 2nd St	Solano	73.1
Solano	Rio Vista	Downtown Waterfront Path	Solano	-
Solano	Vacaville	Downtown Creekwalk	Solano	-
Solano	Vallejo	Waterfront Path	Solano	-
		AVERAGE		**14.8**

MTC Bicycle/Pedestrian Data Collection Project

Table 3 - Collision Rates by County

County	Jurisdiction	Intersection	County	Collisions per Million Trips
Sonoma	Cotati	Old Redwood Hwy @ Cotati Ave	Sonoma	0.0
Sonoma	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	Sonoma	0.0
Sonoma	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	Sonoma	0.0
Sonoma	Sonoma	Hwy 12-Sonoma Hwy @ Verano	Sonoma	0.0
Sonoma	Sonoma	Broadway @ W. Napa St (12)	Sonoma	0.0
Sonoma	Healdsburg	Healdsburg Ave @ Matheson St	Sonoma	2.3
Sonoma	Santa Rosa	2nd St @ Santa Rosa Ave	Sonoma	2.4
Sonoma	Santa Rosa	Mendocino Ave @ Pacific Ave	Sonoma	14.3
Sonoma	Petaluma	A St @ Howard St and 6th St	Sonoma	82.2
		AVERAGE		**11.2**

MTC Bicycle/Pedestrian Data Collection Project

Table 4 - Collision Rates by Area Type

County	Jurisdiction	Intersection	Area Type	Collisions per Million Trips
Napa	County	Dry Creek @ Orchard	Rural	0.0
Napa	County	Old Sonoma Rd @ 121	Rural	0.0
Solano	County	Dixon-Davis Bike Route @ Vaughn	Rural	0.0
Solano	Fairfield	Hwy 12 Jameson Canyon @ Red Top Rd	Rural	0.0
Napa	Yountville	Finnell @ Yountville Cross	Rural	2.9
Alameda	Livermore	Wente St/Concannon @ Livermore Ave	Rural	12.9
Napa	Oakville	Siverado Trail @ Oakville Cross	Rural	36.5
Solano	Benicia	Military West @ 2nd St	Rural	73.1
Solano	Rio Vista	Downtown Waterfront Path	Rural	-
		AVERAGE		**15.7**
Alameda	Dublin	Iron Horse @ Dublin Blvd	Suburban	0.0
Contra Costa	Brentwood	Brentwood Blvd @ Oak	Suburban	0.0
Contra Costa	Concord	Grant @ Concord Blvd	Suburban	0.0
Contra Costa	El Cerrito	Ohlone Trail @ Fairmount Ave	Suburban	0.0
Contra Costa	Lafayette	Mt. Diablo @ Moraga Rd	Suburban	0.0
Contra Costa	Martinez	Muir Rd @ Pacheco Blvd	Suburban	0.0
Contra Costa	Orinda	Moraga Wy @ Ivy Dr	Suburban	0.0
Contra Costa	Pittsburg	Delta De Anza Trail @ Los Medanos	Suburban	0.0
Contra Costa	San Ramon	Executive Prkwy @ Camino Ramon	Suburban	0.0
Marin	Novato	Alameda del Prado/Nave Dr	Suburban	0.0
Marin	San Rafael	B St @ 2nd St	Suburban	0.0
Marin	Mill Valley	Mill Valley Path @ E. Blithdale	Suburban	0.0
Marin	Tiburon	Main St @ Tiburon Blvd	Suburban	0.0
Marin	Mill Valley	101 @ Seminary	Suburban	0.0
Napa	American Canyon	SR 29 @ American Canyon	Suburban	0.0
Napa	Calistoga	Lincoln St (SR 29) @ Washington St	Suburban	0.0
San Mateo	Daly City	John Daly Blvd @ Lake Merced Blvd	Suburban	0.0
San Mateo	Daly City	Mission @ E. Market	Suburban	0.0
San Mateo	Half Moon Bay	Main @ Correas	Suburban	0.0
San Mateo	Millbrae	Millbrae @ Magnolia	Suburban	0.0
San Mateo	Pacifica	Francisco @ Paloma	Suburban	0.0
San Mateo	San Bruno	El Camino @ Sneath	Suburban	0.0
Santa Clara	Palo Alto	University @ Emerson	Suburban	0.0
Santa Clara	Santa Clara	El Camino Real @ Railroad	Suburban	0.0
Solano	Suisun City	Main @ Lotz	Suburban	0.0
Solano	Vallejo	Solano Bikeway @ Columbus Prkwy	Suburban	0.0
Sonoma	Cotati	Old Redwood Hwy @ Cotati Ave	Suburban	0.0
Sonoma	Rohnert Park	Petaluma Hill Rd @ Rohnert Park Expwy	Suburban	0.0
Sonoma	Sebastapol	S. Main @ Joe Rodota Trail (Burnett St)	Suburban	0.0
Sonoma	Sonoma	Hwy 12-Sonoma Hwy @ Verano	Suburban	0.0
Sonoma	Sonoma	Broadway @ W. Napa St (12)	Suburban	0.0
Santa Clara	Palo Alto	Foothill @ Page Mill	Suburban	0.8
Marin	Corte Madera	Camino Alto @ Madera/Chapman	Suburban	1.3
San Mateo	South SF	Grand @ Airport Blvd	Suburban	2.0
Sonoma	Healdsburg	Healdsburg Ave @ Matheson St	Suburban	2.3
Sonoma	Santa Rosa	2nd St @ Santa Rosa Ave	Suburban	2.4
Contra Costa	Antioch	L St. @ 18th St	Suburban	2.7
Santa Clara	Morgan Hill	Monterey @ Main (El Camino Real)	Suburban	3.1
Santa Clara	Gilroy	Monterey @ 7th St	Suburban	3.2
San Mateo	Redwood City	Main @ Middlefield	Suburban	3.6
San Mateo	Redwood Shores	Redwood Shores @ Twin Dolphin	Suburban	4.1
Marin	Larkspur	E. S.F. Drake @ Larkspur Landing	Suburban	4.1
Napa	Napa	1st @ School Rd	Suburban	4.3
Santa Clara	Cupertino	Stevens Creek @ De Anza	Suburban	5.1
Contra Costa	County/P.H.	Coggins and Jones @ Treat	Suburban	5.3
Contra Costa	Richmond	MacDonald @ Marina	Suburban	6.0
Solano	Dixon	First Street @ C St	Suburban	6.1

MTC Bicycle/Pedestrian Data Collection Project

Table 4 - Collision Rates by Area Type

County	Jurisdiction	Intersection	Area Type	Collisions per Million Trips
Marin	Fairfax	Pacheco @ Center/Broadway	Suburban	6.6
San Mateo	East Palo Alto	University @ Bay Road	Suburban	8.2
Alameda	San Leandro	Bancroft @ Estudillio	Suburban	8.2
Alameda	Pleasanton	Bernal @ Main	Suburban	8.9
Santa Clara	Campbell	Bascom @ Hamilton	Suburban	9.8
Santa Clara	Mountain View	California St @ Escuela Av	Suburban	11.2
San Mateo	San Mateo	Delaware St @ 3rd Ave	Suburban	11.8
Alameda	Fremont	Fremont Blvd @ Mowry	Suburban	12.5
Solano	Vacaville	Alamo @ Nut Tree	Suburban	12.7
Sonoma	Santa Rosa	Mendocino Ave @ Pacific Ave	Suburban	14.3
Marin	Sausalito	Bridgeway @ Princess	Suburban	14.6
Napa	St Helena	Main (SR 29) @ Adams (St. Helena Hwy)	Suburban	14.6
San Mateo	Foster City	Hillsdale Blvd @ Edgewater Blvd	Suburban	15.1
Napa	Napa	Lincoln Ave @ Jefferson St	Suburban	18.3
Contra Costa	Walnut Creek	Ygnacio Valley Rd @ Walnut Blvd	Suburban	19.3
Alameda	Emeryville	Powell St @ Christie	Suburban	20.5
Marin	San Rafael	4th St @ Lincoln Ave	Suburban	21.6
Alameda	Alameda	Otis @ Park	Suburban	22.5
Alameda	Union City	Alvarado-Niles @ Decoto	Suburban	24.4
Alameda	Hayward	Winton @ Amador	Suburban	26.0
Solano	Fairfield	Travis @ Texas	Suburban	26.3
Santa Clara	Santa Clara	Homestead Rd @ Kiely Blvd	Suburban	30.7
San Mateo	Belmont	Ralston @ 6th	Suburban	38.7
Santa Clara	Milpitas	Dixon Landing @ Milpitas	Suburban	38.7
Contra Costa	Danville	Railroad Ave @ Hartz/Danville Blvd	Suburban	42.1
Marin	Novato	Grant @ 7th St	Suburban	48.7
San Mateo	Burlingame	California Dr @ Lincoln Ave	Suburban	57.7
Sonoma	Petaluma	A St @ Howard St and 6th St	Suburban	82.2
Solano	Vacaville	Downtown Creekwalk	Suburban	-
Solano	Vallejo	Waterfront Path	Suburban	-
		AVERAGE		**9.6**
Santa Clara	San Jose	San Fernando @ 7th	Urban	0.0
San Francisco	San Francisco	GG Park Panhandle @ Baker St	Urban	0.4
San Francisco	San Francisco	Embarcadero @ Washington	Urban	1.1
San Francisco	San Francisco	Seventh @ Folsom	Urban	1.5
Santa Clara	San Jose	Santa Clara @ Montgomery	Urban	2.2
Alameda	Oakland	66th @ San Leandro	Urban	3.4
San Francisco	San Francisco	3rd St @ 16th St	Urban	4.5
San Francisco	San Francisco	Haight @ Scott	Urban	5.8
Alameda	Oakland	Grand Av @ Staten Av	Urban	6.6
Alameda	Berkeley	Virginia @ San Pablo	Urban	6.8
Alameda	Berkeley	Hearst @ Oxford	Urban	8.9
San Francisco	San Francisco	Van Ness @ Turk	Urban	14.9
San Francisco	San Francisco	3rd St @ Howard	Urban	-
San Francisco	San Francisco	Geary @ Divasadero	Urban	-
San Francisco	San Francisco	Ocean @ Geneva	Urban	-
		AVERAGE		**4.7**